EVOQUA
WATER TECHNOLOGIES

***Via Email to [R9LandSubmit@epa.gov](mailto:R9LandSubmit@epa.gov)*** October 4, 2019

Director, Land Division
US Environmental Protection Agency, Region 9
75 Hawthorne Street (LND-1)
San Francisco, CA 94105

**Re: Evoqua Water Technologies – Parker, Arizona Facility**
**USEPA ID No.: AZD 982 441 263**
**Resubmittal of Modifications No. 001 and 004 – Class 1 with Director Approval: Subpart BB, CC and FF Compliance Plans and Waste Analysis Plan**

Dear Mr. Scott:

In accordance with 40 CFR 270.42(a), Evoqua Water Technologies LLC hereby submits a Class 1 permit modification package to the Environmental Protection Agency, Region 9 for the Hazardous Waste Permit issued to its facility located at 2523 Mutahar Street in Parker, Arizona. This permit modification package is classified as a Class 1 modification in 40 CFR 270.42 Appendix I, Section A.1 which provides for "administrative and informational changes" and Section B.3 which provides for "changes in procedures for maintaining the operating record". In accordance with Permit Conditions 1.K,1, I.K.2, and I.K.3, these modifications are classified as Class 1 Permit modifications requiring Director approval.

These Class 1 permit modifications are being submitted to address comments received on Modifications No. 001 and 004in an EPA letter dated May 30, 2019. The letter requested changes to the modification requests that were previously submitted by Evoqua. By email of May 30, EPA extended the requested response date for this resubmittal to August 15, 2019.

In addition, a revised Subpart FF plan is also being submitted for informational purposes to amend Permit Attachment Appendix XXIII. Pursuant to Permit Section IV.G.1.b, "[t]he Subpart FF Compliance Plan is attached for informational purposes only and is not considered a part of this Permit." Although not part of the final permit, this plan is used to satisfy certain requirements of the Subpart BB and CC plans.

To facilitate review, redlined and clean versions of the Subpart FF, Subpart CC, Subpart BB and Waste Analysis Plan are enclosed.

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Pursuant to 40 CFR 270.42(a)(1), this modification does not require any other changes to applicable information previously submitted pursuant to 40 CFR 270,13 – 270.21, and 40 CFR 270.62 - .63 do not apply.

Posting Instructions for this modification:

Please replace existing Appendices IV, XIX, XX and XXIII with the enclosed Appendices.

Notifications:

A Class 1 permit modification requires a notice to the Facility mailing list within 90 days of the date the change is put into effect. Evoqua will provide this notice following receipt of the Director's approval for the modification package.

Permit modifications will also be posted at the following electronic address:

http://www.evoqua.com/en/about/service-locations/Pages/Parker-AZ-Permits.aspx

EVOQUA
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*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Permittee

EVOQUA WATER TECHNOLOGIES LLC

By: ____________________
Its:
Rodney Aulick
EVP and Segment President
Integrated Solutions and Services

# REDLINE
# VERSIONS

Appendix IV.........................Waste Analysis Plan Rev 4

Appendix XIX........Subpart BB Compliance Plan Rev 1

Appendix XX.........Subpart CC Compliance Plan Rev 8

Appendix XXIII....Subpart FF Compliance Plan Rev 11

Revisions October 2019

PERMIT ATTACHMENT

# APPENDIX IV

## WASTE ANALYSIS PLAN

**Evoqua Water Technologies**
**2523 Mutahar Street**
**Parker, Arizona  85344**

**~~January~~ October 2019**
**Revision ~~3~~4**

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## LIST OF APPENDICES

**Appendix**



Note that the appendices are included with the WAP for informational purposes~~,~~ and represent examples of the types of information contained in these documents. The actual documents may be modified from time to time as deemed necessary by the facility, without changing the WAP.

# 1.0 INTRODUCTION

This Waste Analysis Plan has been prepared for the Evoqua Water Technologies (EWT) carbon reactivation facility located in Parker, Arizona. It is intended to comply with the waste analysis requirements found in 40 CFR Part 264.13 and 265.13. A description of the facility can be found in Section D of the facility's RCRA Part B permit application. This Waste Analysis Plan applies only to spent carbon that is classified as hazardous waste in accordance with 40 CFR Part 261.

The procedures and information that make up this document establish EWT's policy for the acceptance of spent carbon classified as hazardous waste and the analysis of spent carbon. The forms contained in this Waste Analysis Plan are offered to establish the general information to be documented. The format and wording of these forms may be changed from time to time without modifying the Waste Analysis Plan. EWT will provide copies of these forms to EPA as they are revised.

All records are retained in accordance with the recordkeeping requirements of 40 CFR 264.73. EWT's records retention requirements are summarized in Appendix XXI.

## 2.0 INFORMATION SUPPLIED BY HAZARDOUS WASTE GENERATORS

Spent carbon processed at the EWT facility will be received only after it is pre-approved for processing by EWT as described below.

The prospective generator (originator) of a source of spent carbon will begin the approval process by making application to EWT using a Spent Carbon Profile Form (SCPF). The generator will complete the SCPF in accordance with the guidance supplied with each form. The information supplied by the generator must be from analysis of a sample which is representative of the spent carbon being profiled. An example of a SCPF can be found in Appendix A.

Section 3 of the SCPF provides space for the generator to provide a specific description of the process generating the spent carbon including constituents being treated. A copy of the analytical data must be included with the SCPF.

EWT will perform a completeness review on each SCPF. Should any deficiencies be found, EWT will work with the generator to ensure the SCPF is complete before proceeding with the pre-acceptance process.

In order to ensure proper storage and treatment of the spent carbon, at a minimum, the pre-acceptance parameters listed in Table 4-1 will be determined for all samples before final profile approval is given. Table 4-1 also lists the rationale for the analyses chosen as well as the analytical methods to be used. EWT will make a determination of what additional analyses, if any, will be performed based on the information supplied on the SCPF. As part of the profiling process, the generator must make a determination and indicate in the space provided on the SCPF that based on analytical data of the waste stream and/or their knowledge of the process producing the spent carbon whether the spent carbon is a hazardous waste as defined by 40 CFR Part 261. In all cases where a determination has been made that the spent carbon is a RCRA hazardous waste, the generator is required to provide analytical data for characterization.

Based on the information supplied on the SCPF and the results of the spent carbon analysis, the generator's spent carbon will either be approved or rejected for treatment at the Parker facility. The decision to approve or reject a generator's spent carbon will be made by EWT plant management. The generator will be advised of the determination. If the spent carbon is approved for treatment, the spent carbon will be assigned a spent carbon approval number.

The generator is required to submit a revised SCPF (including appropriate analytical data) whenever there is reason to believe that the nature of the spent carbon has changed (e.g., from process or operational modifications). At a minimum, each generator must submit an updated SCPF and current analytical data at least every two years. Analytical data submitted with the profile information must be no more than 6 months old.

In the case where EWT discovers that a shipment of spent carbon exhibits a significant discrepancy from the waste profile information, the generator will be required to re-characterize the waste and may also be required to develop a new waste profile (including appropriate analytical data), before the shipment will be accepted for treatment.

## 3.0 PROCEDURES USED TO INSPECT SPENT CARBON RECEIVED

Upon arrival at the facility, each load will be inspected by a Material Handler or other qualified person to ensure the material is spent carbon and that the quantity of spent carbon agrees with the quantity stated on each manifest. For loads of containerized spent carbon, the drums or other containers will be counted to ensure that the quantity agrees with the manifest. Each container will be checked to ensure that a correctly completed hazardous waste label is present and that the label agrees with the contents stated on the manifest. After the quantity check, samples of the containerized spent carbon will be obtained as described in Section 5.

Bulk shipments will also be inspected. The manways or "domes" will be opened and the depth of the carbon will be visually inspected. The estimated quantity or volume in the truck will be compared with the quantity listed on the Hazardous Waste Manifest. After the quantity check, samples of the tank contents will be obtained as described in Section 5.

In the event further testing is required to make a decision or characterize the spent carbon, the facility may temporarily store the material pending analytical results.

An Incoming Spent Carbon Tally Sheet/On-Site Screening Report (see Appendix B) will be completed for each load by a Material Handler or other qualified person. This form will be filed and maintained as part of the facility's Operating Record.

# 4.0 CONFIRMATION OF COMPOSITION OF SPENT CARBON RECEIVED

As discussed in Section 2 of this document, the spent carbon generator is required to provide certain characterization and analytical data to SWT, prior to waste acceptance at the facility. Analytical data to be provided by the generator, including the rationale for the analysis, and the appropriate analytical methods, are described in Table 4-1.

The remainder of this section describes how facility personnel confirm that the materials received correspond to the pre-acceptance data supplied by the generator, and how facility personnel sample and analyze the incoming materials to confirm compliance with feed rate restrictions on the carbon reactivation unit. The locations within the facility and the carbon reactivation process where samples are collected are shown schematically in Figure 4-1.

## 4.1 CONTAINERIZED SPENT CARBON

Each container of spent carbon will be opened by a Material Handler or other qualified person, and the contents of the container will be visually inspected for foreign matter. The general appearance of the carbon will be observed. As described in the sampling procedure (see Section 5) representative samples will be obtained. A composite of the spent carbon samples from each load from each generator, or a single sample if only one container was received from the generator, will be subjected to the on-site screening tests listed in Table 4-2.

## 4.2 BULK SPENT CARBON

Each bulk load of spent carbon will be sampled by a Material Handler or other qualified person, as described in Section 5. Representative samples of the bulk load will be obtained as described in the sampling procedure in Section 5.0. The samples will be visually inspected for general appearance and the presence of foreign matter. A composite of the spent carbon samples will be subjected to the on-site screening tests listed in Table 4-2.

## 4.3 ON-SITE SCREENING

The composite samples obtained from each load from each generator's containerized spent carbon shipment and from bulk loads will be subjected to the on-site screening analyses listed in Table 4-2. EWT's procedures for on-site screening are provided in Appendix C to the WAP. The results of the analyses will be recorded on the Incoming Spent Carbon Waste Tally Sheet and On-Site Screening Report (see Appendix B) by trained personnel and reviewed by plant management. If the spent carbon is accepted, the spent carbon will be transferred into a designated storage tank or container storage area.

If, based on the visual inspection and the on-site screening analyses, the spent carbon is different than that described on the customer Spent Carbon Profile Form and/or the

Hazardous Waste Manifest, the generator will be notified of the discrepancy. If the discrepancy cannot be immediately resolved, the spent carbon may be retained on-site while the investigation of the discrepancy continues. If the discrepancy cannot be resolved, the spent carbon will be rejected and directed back to the generator or an alternate facility per generator direction. If the discrepancy cannot be resolved within 15 days, EWT will notify EPA as required by 40 CFR 264.72(b) and (c).

## 4.4 RATIONALE FOR ANALYSES SELECTED FOR ON-SITE SCREENING

The rationale for the analysis selected to be performed as part of the on-site screening is given in Table 4-2.

## 4.5 ANALYSES PERFORMED FOR PERMIT COMPLIANCE

The RF-2 carbon reactivation furnace conducted a Performance Demonstration Test and established feed rate limits for the following constituents as a result of that test:

- Mercury
- Semi volatile metals (cadmium, lead)
- Low volatility metals (arsenic, beryllium, chromium)
- Total chlorine/chloride
- Sulfur

In order to continuously demonstrate compliance with the mercury, SVM, LVM and chorine feed rate limits, the most recent analytical results (designated as the “analysis of record”) are recorded in the process computer system. A rolling average feed rate of each regulated constituent is computed and recorded based on the analysis of record and the measured mass feed rate of spent activated carbon.

In order to demonstrate compliance with $SO_2$ emission limits of 30 tons per year, the average monthly results for sulfur will be used to calculate the 12-month rolling average.

The following formula will be used:

$$(\text{Feed Rate} \times \text{Operating Hours} \times (64/32) \times \%\ \text{Sulfur} \times (1-.90)) / 2000 = SO_2\ \text{Tons/Year}$$

Based on maximum spent carbon feed rate, maximum operating hours in a year and a scrubber control efficiency of 90%, the maximum sulfur loading on the spent carbon cannot exceed 11,232 mg/kg.

A grab sample of the feed spent activated carbon is collected four times daily (twice each shift) when the process is operating. These samples are collected by the process operators from the weigh belt. The four daily grab samples are stored in the on-site laboratory. At the end of each approximately 15 to 20 day period (selected such that the samples will not exceed the 28 day holding time for Hg analysis), the samples collected from that time period are combined and then sub-sampled to form a composite feed sample. This composite is analyzed using the methods described in Table 4-3.

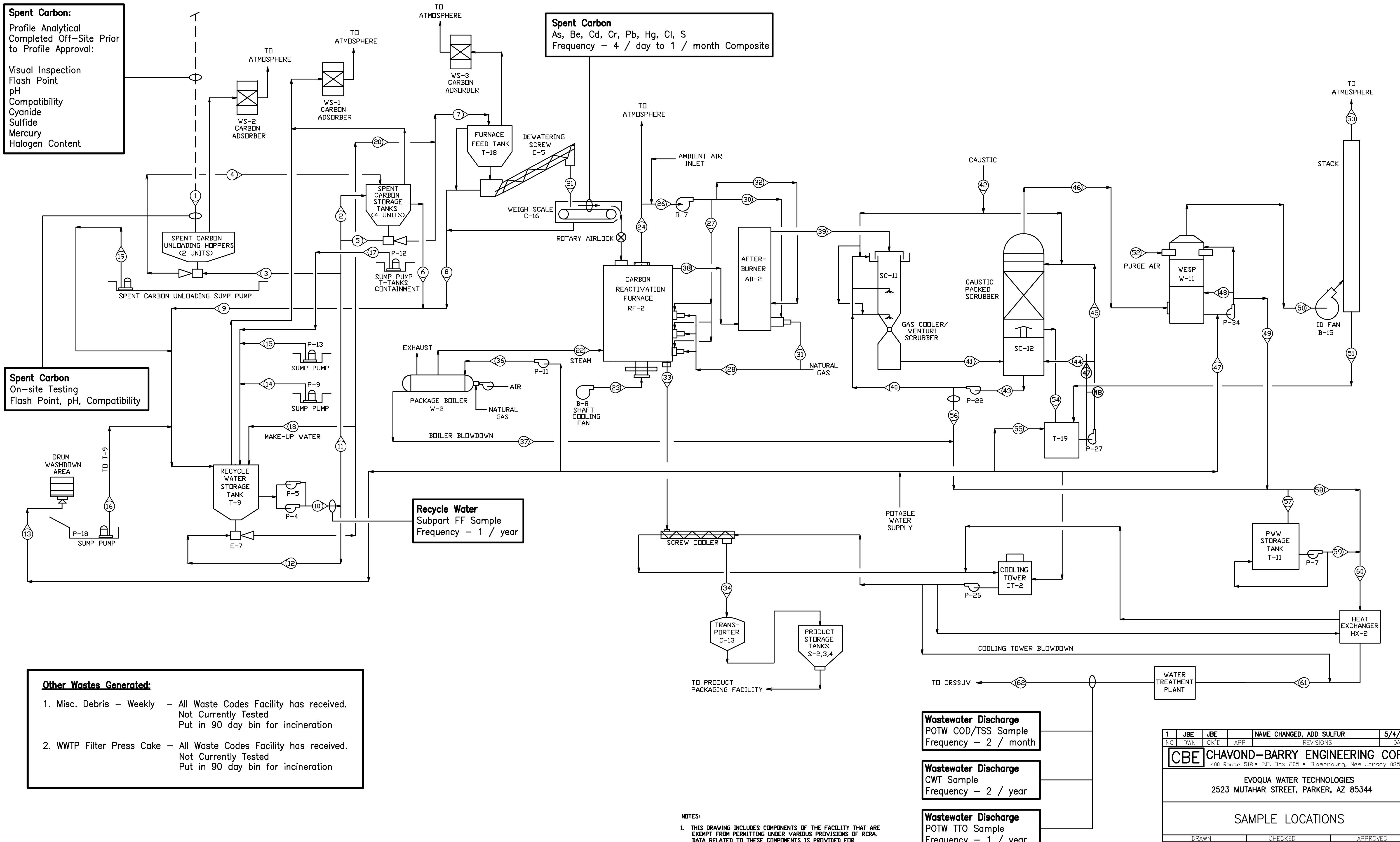
Following receipt of the feed composite sample analyses, the data are entered into a spreadsheet where the most recent 12 months of analytical results are averaged. When each new analytical result is entered, the 12-~~-~~month average is updated. The most recent 12-~~-~~month average result is designated as the “analysis of record” for purposes of calculating the constituent feed rate values used for permit compliance demonstration.

While EWT’s contract laboratory matrix spike recovery results are routinely within the method limits, EPA has expressed concern that analyte recovery may be problematic in activated carbon samples. EWT has agreed to review the results of matrix spike recoveries for the regulatory compliance analyses (metals and total chlorine) and to adjust the analytical result using the spike recovery if the recovery falls below the method limits. The following equation will be used if such analytical result adjustment is needed:

$$C_{corr} = C_{unc} \times \frac{100}{Spike\ Recovery\ \%}$$

Where:

$C_{corr}$ = Corrected analytical result
$C_{unc}$ = Uncorrected analytical result




**Other Wastes Generated:**

1. Misc. Debris – Weekly – All Waste Codes Facility has received. Not Currently Tested Put in 90 day bin for incineration
2. WWTP Filter Press Cake – All Waste Codes Facility has received. Not Currently Tested Put in 90 day bin for incineration

NOTES:

1. THIS DRAWING INCLUDES COMPONENTS OF THE FACILITY THAT ARE EXEMPT FROM PERMITTING UNDER VARIOUS PROVISIONS OF RCRA. DATA RELATED TO THESE COMPONENTS IS PROVIDED FOR INFORMATIONAL PURPOSES AND EASE OF REVIEW ONLY, AND THEY ARE NOT INTENDED TO BECOME REGULATED COMPONENTS OF THE HAZARDOUS WASTE FACILITY.

| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 1 | JBE | JBE | | NAME CHANGED, ADD SULFUR | 5/4/16 |

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400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

SAMPLE LOCATIONS

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 7/6/11 | KEM | 7/7/11 | | |

| SCALE | DWG. NO. | REV. |
|---|---|---|
| NONE | WAP-001 | 1 |

PRINT DATE: 5/4/16

TABLE 4-1
SUMMARY OF PRE-ACCEPTANCE ANALYTICAL PARAMETERS, RATIONALE, AND TEST METHODS

| PARAMETER | RATIONALE | METHODS | USES |
|---|---|---|---|
| Visual Inspection | Verify that the material is spent carbon, and used to identify the obvious presence or absence of free liquid and/or debris, coloration, and whether the spent carbon is a vapor phase or liquid phase carbon, etc. The initial characterization of a particular spent carbon will be used for comparison against each subsequent load of that same spent carbon received at the facility. | Visual Inspection | Pre-acceptance |
| Flash-point (1) | Indicates whether the free liquid or solid portion of the spent carbon exhibits the characteristics of ignitability. This information is used to determine the storage requirements for the spent carbon prior to treatment. Liquids with a flash point <140°F will not be accepted into the facility. | SW-846 Method 1010M, 1010, or ASTM D3278 | Pre-acceptance |
| pH (2) | Identifies materials that have the potential to corrode pipes, tanks and ancillary equipment. | SW-846 Method 9041, 9040, or 9045 depending on free moisture in sample | Pre-acceptance |
| Compatibility | Identifies materials that have the potential to be incompatible. | ASTM D5058 (Method C) or IM-101S | Pre-acceptance |
| Cyanide | Identifies potentially reactive spent carbon. Spent carbon with reactive cyanide >250ppm will not be accepted at the facility. | SW-846 Method 9010 | Pre-acceptance |
| Sulfide | Identifies potentially reactive spent carbon. Spent carbon with reactive sulfide >500ppm will not be accepted at the facility. | SW-846 Method 9030 | Pre-acceptance |
| Mercury | Process information. | SW-846 Method 7471 (Cold Vapor Technique) | Pre-acceptance |
| Halogen Content | Process information. | SW-846 Method 5050 (bomb combustion)<br>SW-846 Method 9252A | Pre-acceptance |

Notes:
1. If fingerprinting with an open flame is positive then run one of the methods.
2. Analysis performed on free liquids retained in incoming spent carbon samples or on a 1:1 mixture of the incoming vapor phase carbon sample and deionized water. Initial screening is performed using Method 9041. Should Method 9041 indicate the sample is potentially corrosive, Method 9040 or Method 9045 is used for final confirmation that a material is corrosive.
3. All method numbers are shown without suffix. The latest promulgated method will be used.
4. SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update. ASTM refers to *Annual Book of ASTM Standards*, ASTM International.

Table 4-2
SUMMARY OF ON-SITE SCREENING ANALYTICAL PARAMETERS, RATIONALE AND TEST METHODS

| PARAMETER | RATIONALE | METHODS | USES |
|---|---|---|---|
| Visual Inspection | Verify that the material is spent carbon, and used to identify the obvious presence or absence of free liquid and/or debris, coloration, and whether the spent carbon is a vapor phase or liquid phase carbon. | Visual | On-site screening; Must conform to physical description on profile |
| Ignitability(1) | Indicates whether the carbon will support a flame at ambient conditions. This information is used to determine the storage requirements for the spent carbon prior to treatment, and to verify ignitability information provided by the generator. | Open ignition in controlled environment | On-site screening; Diluted sample must not support combustion |
| pH | Identifies materials that have the potential to corrode pipes, tanks and ancillary equipment. | Add DI water 1:1 and check pH using test strips. (Reference: EPA Method 9041M/9045M) | On-site screening; Must be within range on profile |
| Compatibility | Identifies materials that have the potential to be incompatible with water. | ASTM D5058 (Test Method C – Water Compatibility) or IM-101S | On-site screening; Must not show adverse reaction with water |

Notes:

(1) Fingerprinting is conducted by applying a flame to the carbon sample in a controlled environment. If the carbon supports a flame under these conditions, the sample is mixed 1:1 with deionized water and the procedure is repeated. The test is positive if the diluted sample supports combustion above the water surface.

Method numbers are shown without suffix. The latest promulgated methods will be used.

SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update.
ASTM refers to *Annual Book of ASTM Standards*, ASTM International.

TABLE 4-3
SUMMARY OF PERMIT COMPLIANCE ANALYTICAL PARAMETERS, RATIONALE, AND TEST METHODS

| PARAMETER | RATIONALE & FREQUENCY | METHODS | USES |
|---|---|---|---|
| Arsenic, Beryllium, Cadmium, Chromium, Lead | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-~~—~~day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method ~~-~~3050 (acid digestion) SW-846 Method 6010 (ICP) | Calculation of constituent feed rate; comparison to permit limit. |
| Mercury | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-~~—~~day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method 3050 (acid digestion) SW-846 Method 7471 (CVAAS) | Calculation of constituent feed rate; comparison to permit limit. |
| Sulfur (1) | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-~~—~~day composite. Analysis of each composite to form 12-month rolling average. | EPA Method 5050/9056A | Comparison to maximum permitted sulfur loading on spent carbon. |
| Total chlorine | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-~~—~~day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method 5050 (bomb combustion) SW-846 Method 9252A | Calculation of constituent feed rate; comparison to permit limit. |

Notes;

(1) See Appendix D for Standard Operating Procedure for Sulfur as Sulfate

Method~~Note: method~~ numbers are shown without suffix. The latest promulgated methods will be used.

SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update.

## 5.0 PROCEDURES USED TO OBTAIN A REPRESENTATIVE SAMPLE OF SPENT CARBON

Sampling of spent carbon will be employed as part of the on-site screening process and permit compliance as described below.

### 5.1 BULK LOADS

A representative sample of each bulk load will be obtained using either a shovel or scoop. The sampling instrument will be rinsed with water after every sampling event. The sample from each bulk shipment will be taken to the laboratory for screening analyses.

### 5.2 CONTAINERS

Each container will be opened for the purpose of inspection and sampling. The lid or top on each container will be left loosely in place unless sampling or inspection of the container is actually occurring. A Material Handler or another designated employee will obtain one sample from each randomly selected container using the following selection strategy.

1. The number of containers chosen for random selection from each spent carbon generator will equal the square root plus one of the total shipped by the generator in each load. Thus, if a generator shipped one container, that container would be sampled. If a generator shipped sixteen containers, five would be sampled. If the square root is not an integer, it will be rounded to the next highest number. The waste tally sheet and EWT internal labels are generated by computer and perform the random sampling calculations. Printed tally sheets and labels designate which containers are to be sampled.

2. If any container contains a spent carbon which either is visually different from the profiled spent carbon, or a composite of the individual samples fails the on-site screening process described in Section 4, each container from that spent carbon generator may be sampled and subjected to the on-site screening analyses listed in Table 4-2.

Each representative sample will be obtained using the appropriate adaptation of the general methodology listed in ASTM Standard D346. The sample will be placed in clean sample jars, covered with an appropriate lid, and immediately taken to the facility laboratory for analysis. A label will be placed on each jar, indicating the profile number and the date of the sample. After sampling, the lid will be replaced on each container and it will be sealed if it is going to be stored. A composite sample will be analyzed from each load of spent carbon received from each generator. The composite sample will be prepared by combining equal amounts of carbon from each grab sample that was collected from the randomly selected containers in the load.

## 5.3 CARBON FEED

Four times daily, the access cover of the weigh belt will be opened for the purpose of sampling. An operator or another designated employee will obtain one grab sample of the feed carbon, and place the sample into a clean sample jar.

At the end of each day, the four grab samples will be stored in the on-site laboratory.

At the end of each approximately 15 to 20 day period, the daily feed samples will be opened and an equal amount will be removed from each jar and placed into a clean sample jar, to form a carbon feed composite sample.

A label will be placed on the composite sample jar, indicating the date range of the sample, and the sample will be sent to an off-site laboratory for the analyses listed in Table 4-3.

## 5.4 MAINTAINING AND DECONTAMINATING SAMPLING EQUIPMENT

Equipment used to obtain representative samples will be inspected as per the facility's inspection schedule to ensure it is in proper working order. Sampling equipment will be decontaminated by rinsing with water after each sampling event.

## 5.5 SAMPLING QA/QC PROCEDURES

Sampling equipment is decontaminated between sampling events or is disposed of to minimize the possibility of cross contamination. The equipment is decontaminated using a method appropriate to the type of material sampled. For example, scoops are generally rinsed with water to remove solids. New sampling equipment that is known to be clean will not be decontaminated prior to use.

## 6.0 METHODS TO ENSURE COMPATIBILITY WITH HANDLING METHODS

The spent carbon testing procedures outlined in this Waste Analysis Plan have been developed with cognizance of the spent carbon storage and handling procedures at the Parker facility. The facility is designed to safely store, transfer and reactivate spent carbon, which is contaminated with wastes that are toxic and/or ignitable. The Parker facility takes the necessary precautions to prevent the accidental ignition of ignitable spent carbon. As shown in Table 4-1, the facility pre-acceptance procedures include compatibility testing to identify materials that have the potential to be incompatible. The facility will not receive spent carbon which is characterized by the generator as reactive or corrosive, or spent carbon identified by waste codes which are not authorized for receipt at the facility.

## 7.0 METHODS TO ENSURE WASTE ANALYSIS PLAN IS KEPT UP-TO-DATE

The Plant Manager, Environmental Health and Safety Specialist or another designated person shall review the Waste Analysis Plan at least every two calendar years to determine if it is in compliance with current RCRA regulations and otherwise meets the needs of the facility. A statement that the plan was reviewed will be maintained in the permanent files at the facility.

If the WAP is revised as a result of the review process, a copy of the revised document will be provided to EPA.

## 8.0 LAND DISPOSAL RESTRICTION NOTIFICATION FORMS

Generators of spent carbon that is restricted from land disposal pursuant to 40 CFR 268 will be required to provide appropriate documentation.

At the time of spent carbon receipt, EWT will receive and review the forms, which must accompany the first shipment of spent carbon that is subject to land ban restrictions. EWT will file the completed forms with the Treatment Storage and Disposal copy of the hazardous waste manifest as part of the facility operating record.

# 9.0 SPECIAL PROCEDURAL REQUIREMENTS

This section provides discussion on special procedural requirements applicable to the facility. These include 40 CFR 264 Subpart BB and Subpart CC applicability.

## 9.1 Subpart BB

The facility Subpart BB Compliance Plan is located in Appendix XIX of the Part B Permit

## 9.2 Subpart CC

The Subpart CC Compliance Plan is located in Appendix XVI of the Part B Permit

## 9.3 Wastes Generated On-Site

EWT generates several regulated waste streams as part of its operations. These include debris, filter cake from the wastewater treatment operations, used personnel protective equipment, and spent activated carbon used for tank vent control in compliance with Subpart CC and FF. Of these wastes, all are manifested and sent off site for disposal, with the exception of the spent activated carbon used for tank vent control. This spent activated carbon is similar to the spent carbon received at the EWT facility, as it is derived from the treatment and storage of those carbon streams and is treated by EWT in the same manner as the spent carbon received from off-site.

# WASTE ANALYSIS PLAN

# APPENDIX A

# WASTE PROFILE FORMS

Revision ~~2~~4
~~March 2016~~October 2019

## PROFILE INSTRUCTIONS

**1.** ***Generator information*** The generator of the spent carbon must provide all requested contact information. Completely fill in the mailing address of the generator of the spent carbon. The mailing address is where the manifest will be mailed and must match the manifest mailing address. Completely fill in the name of person responsible for completing the Profile Form and who can be contacted with questions concerning the Profile Form and/or shipment(s). The Site EPA Identification Number must be included if the spent carbon is hazardous.

**2.** ***Consultant information*** If a consultant or subcontractor is providing the profile information on behalf of the generator, the consultant information must be filled out entirely. Completely fill in the street address of the site location of the spent carbon if it is different from 1(a). The address must match the information for the EPA ID Number. If generator, site and/or consultant are the same, please indicate "same". If none, please state "none or n/a".

**3.** ***Properties and Composition of the Spent Carbon*** In addition to a specific description of the process generating the spent carbon enter the specific constituents on the carbon. Please be specific when entering the data in this field, see the examples below.

*Example of unacceptable description of constituents:* VOC's from soil vapor extraction, halogenated hydrocarbons, and other VOC's, etc.

*Example of acceptable description of constituents:* Groundwater remediation to remove benzene or BTEX from a LUST, groundwater remediation for tetrachloroethylene in the vicinity of a dry cleaner, etc. Please list the source of the contamination if known.

**4.** ***Existing Profile Number*** If there is an existing profile number for the spent carbon include the previous approved profile number and expiration date in this section.

**5.** ***Type of Spent Carbon*** Select the applicable carbon type vapor or aqua phased.

**6.** ***Foreign Material*** If the carbon contains any foreign materials such as dirt, rocks or other foreign materials, a representative sample must be sent to the Parker facility at the Arizona physical address for evaluation. A one pound sample is adequate. If nothing is present, please check off "no."

**7.** ***Handling*** Indicate the container in which the carbon will be shipped. Note: containers containing hazardous materials must meet general packaging requirements DOT 49 CFR 173.24. (a)(b).

**8.** ***Free Liquid Range*** An estimated range of free liquid accompanying the spent carbon must be selected.

**9.** ***Liquid Flashpoint*** If the flashpoint range of the free liquid has not yet been determined, please send a sample to SWT for analysis.

**10.** ***pH Range*** If the pH has not yet been determined, please send a sample to the SWT for analysis.

**11.** ***Strong Odor*** If the carbon contains a strong odor a sample must be sent to the Parker facility at the Arizona physical address for evaluation. A one pound sample is adequate.

**12.** ***Superfund Site*** If the spent carbon is from a Superfund site please check the "yes" box. A Superfund site is identified by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or the Superfund Amendments and Reauthorization Act of 1986 (SARA).

**13.** ***Benzene NESHAP*** If the spent carbon comes from a process meeting the requirements of 40 CFR 61.341, please check the "yes" box. The BWON Addendum must be completed and attached to the Profile Form. Total benzene analysis is required on BWON waste streams.

**14.** ***Carbon Containing the Following*** If the spent carbon contains any contaminants listed in items A-I on the Profile Form please check the appropriate box "yes".

Revised October 2014

- **A.** If the spent carbon contains PCBs the Addendum for Non-Regulated PCB Waste must be completed and attached to the Profile Form. Please note the required analysis for each shipment.
- **B.** Dioxins and/or furans will not be accepted at either the Parker or Red Bluff facility.
- **C.** If the spent carbon contains DBCP additional analysis and a review will be required before the profile can be approved.
- **D.** Sulfide or Cyanide will not be accepted at either the Parker or Red Bluff facility.
- **E.** Explosives, pyrophoric or radioactive material will not be accepted at either the Parker or Red Bluff facility.
- **F.** Infectious materials will not be accepted at either the Parker or Red Bluff facility.
- **G.** Shock sensitive material will not be accepted at either the Parker or Red Bluff facility.
- **H.** Oxidizers will not be accepted at either the Parker or Red Bluff facility.
- **I.** Heavy metals must to be identified and totals, not TCLP, metals analysis must be conducted and attached to the Profile Form.

**15.** ***Generator Classification*** Indicate if the spent carbon is considered a hazardous waste under federal RCRA regulations. List all applicable waste codes. (Please see 40 CFR Part 261.31- 261.33 for listed waste codes and 40 CFR Part 261.21 – 261.24 for characteristic waste codes). The federal EPA and many states provide that a spent carbon may be classified as "sludge" when generated from an air pollution control facility municipal, commercial, or industrial wastewater treatment plant or a water supply treatment plant and the spent carbon contains no listed hazardous waste. To qualify for this exemption, the spent carbon must be returned to a reactivation facility where the spent carbon is reclaimed and the spent carbon must be generated in a state whose regulations provide for the classification of such spent carbon as a "sludge." If the spent carbon meets the requirements of 40 CFR 261.2(c)(3)) and the state where it is generated, an Addendum for Sludge Exemption must be completed and submitted with the Profile Form. Note: It is the generator's responsibility to classify the spent carbon.

**16.** ***Generator Classification*** Indicate if the spent carbon is considered a hazardous waste under regulations of the state in which it is generated. If so, list all applicable state waste codes. Note: It is the generator's responsibility to classify the spent carbon.

**17.** ***Land disposal restriction notification*** The USEPA Hazardous Waste Land Disposal Restrictions require that every generator of restricted hazardous waste send a notification that describes the waste and its status under the Land Ban regulations. 40 CFR 268.

**18.** ***Estimated annual carbon usage*** Indicate an estimate of the annual carbon usage, in pounds per year, for the specific profile.

***ANALYTICAL REQUIREMENTS***

Analytical data on the spent carbon are required with each new Profile Form and with each renewal Profile Form even if the waste stream has not changed. Spent carbon should be analyzed for the constituents being treated in the waste stream. Analysis must have been performed within the last six (6) months by a state-certified laboratory, such as the Evoqua Water Technologies laboratory.

***RCRA Profiles only***
RCRA hazardous profiles require additional testing; "11 RCRA Tests". A one-pint sample of the spent carbon must be submitted to Evoqua Water Technologies,. Attn: Lab, 5375 S. Boyle Ave., Los Angeles, CA 90058. It is recommended the "11 RCRA Tests" be performed at by the EWT lab in Vernon, CA because internal test methods are required. A completed and signed LDR is required to be submitted prior to profile approval.

***PROFILE APPROVAL***
Submit the completed electronic Profile Form and all required Addenda via email to your Evoqua Sales representative along with spent carbon samples for testing. Notification of approval will be forwarded to the consultant (if listed) or the generator via email. Upon receipt of your profile approval letter, contact your EWT Sales Representative to schedule service and transportation.

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## SPENT CARBON PROFILE FORM

**GENERATOR INFORMATION**

1. a) Generator: ______________________ b) Site: ______________________
Address: ______________________
Mailing Address: ______________________ ______________________
(Manifest Return) ______________________ ______________________
______________________ ______________________
c) Contact Name: ______________________ d) EPA ID#: ______________________
e) Phone No: ______________________ f) Fax No: ______________________

**CONSULTANT INFORMATION**

2. a) Consultant: ______________________ b) Contact: ______________________
Mailing Address: ______________________ c) Phone: ______________________
______________________ d) Fax: ______________________
______________________ e) Email: ______________________

**PROPERTIES AND COMPOSITION OF THE SPENT CARBON**

3. Provide a specific description of the process generating the spent carbon <u>including constituents</u> being treated. *(Please note if application is for potable water or food processing)*

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

4. If this is a Renewal, Provide the Existing Profile Approval Number: ______________________

5. Type of Spent Carbon: ☐ Aqueous ☐ Vapor

6. Foreign Material: ☐ Yes ☐ No (rocks, dirt, sand, etc.)

7. Handling: ☐ Bulk ☐ Drum ☐ Adsorber ☐ Bulk Bag ☐ Other ______________

8. Free Liquid Range: ☐ 0 ☐ 1 – 15%

9. Liquid Flashpoint: ☐< 140°F ☐ >140°F ☐ N/A Vapor

10. pH Range: ☐ <2 ☐ 2-4 ☐ 4.1-10.5 ☐ >10.5

11. Strong Odor? ☐ Yes ☐ No If yes, please Describe______________________

12. Is spent carbon generated from a Superfund Site? ☐ Yes ☐ No

13. Is the Spent Carbon generated from any activity at a chemical manufacturing plant, petroleum refinery or coke by-product recovery plant, i.e., a facility subject to Subpart FF (the Benzene Waste NESHAP)? *If yes, complete BWON Addendum*. ☐ Yes ☐ No

14. Is the Spent Carbon generated from any activity at an ethylene manufacturing process unit subject to 40 CFR Part 63, Subpart XX (Ethylene MACT)? *If yes, complete the Ethylene MACT Addendum* ☐ Yes ☐ No

15. Does the spent carbon contain any of the following?

| | | |
|---|---|---|
| A. Polychlorinated Biphenyls (PCBs) | ☐ Yes | ☐ No |
| B. Dioxins and/or Furans | ☐ Yes | ☐ No |
| C. Dibromochloropropane (DBCP) | ☐ Yes | ☐ No |
| D. Sulfide or Cyanide | ☐ Yes | ☐ No |
| E. Explosive, Pyrophoric and/or Radioactive material | ☐ Yes | ☐ No |
| F. Infectious material | ☐ Yes | ☐ No |
| G. Shock Sensitive material | ☐ Yes | ☐ No |
| H. Oxidizer | ☐ Yes | ☐ No |
| I. Heavy Metals | ☐ Yes | ☐ No |

**GENERATOR CLASSIFICATION**

16. Is the Spent Carbon a **RCRA** Hazardous Waste? ☐ Yes ☐ No
If yes, list waste code(s) below:
*RCRA Hazardous Waste requires "11 RCRA" Analysis*

______________ ______________ ______________ ______________

______________ ______________ ______________ ______________

17. Is the Spent Carbon a **State** Hazardous Waste? ☐ Yes ☐ No
If yes, list waste code(s) below:

______________ ______________ ______________ ______________

**GENERATOR CERTIFICATION**

**I hereby certify that all information on this and all attached documents are true and that this information accurately describes the subject spent carbon. I further certify that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR 261 Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize Evoqua Water Technologies LLC to obtain a sample from any waste shipment for purposes of confirmation or further investigation. If I am a consultant signing on behalf of the generator, I have their proper approval.**

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

**NOTE**: A completed and signed LDR must be submitted prior to profile approval for RCRA-regulated spent carbon.

*For Internal Use Only*
:

______________________ ______________________
Profile Approval Number Valid Through

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR SLUDGE EXEMPTION

**Generator:** ________________________________

**Site Address**: ________________________________ **City/State:** ______________________

The following information must be provided before approval of the profile if the generator requests that the spent carbon be classified as a non-hazardous sludge for reclamation in accordance with 40 CFR 261.2.

**1.** Is the subject spent carbon a sludge, as defined at 40 CFR 260.10?
☐**Yes** ☐**No**

**2.** Was the subject spent carbon generated from a municipal, commercial, or industrial wastewater treatment plant or water supply treatment plant or air pollution control facility?
☐**Yes** ☐**No**

**3.** Is the subject spent carbon a RCRA listed waste?
☐**Yes** ☐**No**

**4.** Was the subject spent carbon ever placed in contact with, or used to treat, a RCRA **listed** waste?
☐**Yes** ☐**No**

**5.** Was the subject spent carbon generated by a RCRA regulated treatment, storage or disposal facility?
☐**Yes** ☐**No**

**6.** If question 5 is checked YES, does it “contain” or is it “derived from” a RCRA listed waste?
☐**Yes** ☐**No**

**7.** Is the subject spent carbon exempt from hazardous waste regulation in the state of generation?
☐**Yes** ☐**No**

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form. I further certify that the subject spent carbon is exempt from regulation as a hazardous waste.

________________________________ ________________________________
**Printed Name** **Signature**

________________________________ ________________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263
**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## PROFILE ADDENDUM LISTED WASTE APPLICABILITY

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

**1.** Does the spent carbon contain constituents from a pure product release or tank vent?

☐**Yes** ☐**No** ☐ **Unknown ****

**2.** Is the spent carbon from a cleanup of PCE, TCE or other spent solvents from a dry cleaner or from degreasing or other cleaning operations?

☐**Yes** ☐**No** ☐ **Unknown ****

**3.** Is the original process generating the waste an F, K, P or U-listed process?

☐**Yes** ☐**No** ☐ **Unknown ****

** Check the "Unknown" box if this material is generated from remediation activities and the historical processes have not been determined.

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Revised January 2014

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR BENZENE WASTE OPERATIONS NESHAP (BWON) 40 CFR PART 61, SUBPART FF

**Generator:** ________________________________

**Site Address**: ________________________________ **City/State:** ________________

**1.** Is the Spent Carbon generated from any activity at a chemical manufacturing plant, petroleum refinery or coke by-product recovery plant, i.e., a facility subject to Subpart FF (the Benzene Waste NESHAP)?

☐**Yes** ☐**No**

**2.** If Yes, does the spent carbon contain any benzene?

☐**Yes** ☐**No**

**If Yes, the Generator must provide analytical data for total benzene concentration that is representative of the waste stream, consistent with 40 CFR § 61.355.**

**3.** If Yes, does the Spent Carbon contain benzene which is required to be managed and treated in accordance with the provisions of Subpart FF?

☐**Yes** ☐**No**

**If Yes, the Generator agrees that it will:**

(i) send a notice with each shipment of Spent Carbon that is subject to Subpart FF stating that the shipment contains benzene and must be managed and treated in accordance with Subpart FF [40 CFR § 61.342(f)(2)]; and

(ii) Prior to each shipment, test each container of Spent Carbon subject to Subpart FF test requirements to confirm no detectable emissions using EPA Method 21 upon initial use of the container [40CFR § 61.345(a)(1)(i)].

In addition to certification on the attached Spent Carbon Profile Form, I further certify that all information on this Addendum is true and accurate, and that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR § 61.355.

________________________________ ________________________________
**Printed Name** **Signature**

________________________________ ________________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263
**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## PROFILE ADDENDUM FOR NON-REGULATED PCB WASTE

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

**1.** Does the subject spent carbon contain < 50 ppm PCBs?

☐**Yes** ☐**No**

**2.** Does the influent from the subject spent carbon contain < 50 ppm PCBs?

☐**Yes** ☐**No**

**3.** Is the subject spent carbon regulated under 40 CFR Part 761?

☐**Yes** ☐**No**

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form. I further certify that any PCBs (Polychlorinated Biphenyls) on the carbon is non-regulated under 40 CFR Part 761 (non TSCA regulated). I will submit PCB analytical results of the carbon prior to each shipment.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR ETHYLENE MANUFACTURING PROCESS UNIT WASTES MACT 40 CFR PART 63, SUBPART XX

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** _______________

**1**. Is the Spent Carbon generated from any activity at an ethylene manufacturing process unit subject to 40 CFR Part 63, Subpart XX (the Ethylene MACT)?

☐ **Yes** ☐ **No**

**2**. If Yes to Q. 1, does the spent carbon contain any benzene which is required to be managed and treated in accordance with the provisions of the Ethylene MACT?

☐ **Yes** ☐ **No**

**3**. A. If Yes to Q. 1, does the spent carbon contain any 1,3-butadiene which is required to be managed and treated in accordance with the provisions of the Ethylene MACT?

☐ **Yes** ☐ **No**

B. For carbon that contains any 1,3-butadiene, was the carbon used to manage and/or treat a continuous butadiene waste stream that contained greater than or equal to 10 ppmw 1,3-butadiene and with a flow rate greater than or equal to 0.02 liters/minute?

☐ **Yes** ☐ **No**

**If Yes, the Generator agrees that it will:**

(i) send a notice with each shipment of spent carbon that is subject to the Ethylene MACT stating that the shipment contains organic HAPs that are required to be treated in accordance with the Ethylene MACT, 40 CFR Part 63, Subpart XX; and

(ii) Prior to each shipment, test each container of spent carbon subject to the Ethylene MACT test requirements to confirm no detectable emissions using EPA Method 21 upon initial use of the container [40CFR § 61.345(a)(1)(i)].

In addition to certification on the attached Spent Carbon Profile Form, I further certify that all information on this Addendum is true and accurate, and that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR §§ 63.1095 and 61.355.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Revised Janaury 2014

# WASTE ANALYSIS PLAN

# APPENDIX B

# EXAMPLE SPENT CARBON TALLY SHEET

Revision 4
~~March~~ October ~~2016~~2019

# Incoming Spent Carbon Waste Tally and On-site Screening Report

CC

| Generator Name | | | Approval # |
|---|---|---|---|
| SAMPLE WASTE TALLY | | | W120000RH |
| **Container Type** | **Quantity** | **Manifest #** | **Samples** |
| Bag | 5 | 123456 | |

On-site Screening Report

Results taken from  containers were:

| Ignitable Solid | | Compatable | | Composite PH (4.1 to 10.5) |
|---|---|---|---|---|
| Yes | No | Yes | No | |
| **On-Site Screening Completed By (Sign Below)** | | | | **Date** |
| | | | | |

| Container | % Full | * Sealed? (see note below) | Material | Sample |
|---|---|---|---|---|
| 1 | | | | ☑ |
| 2 | | | | ☑ |
| 3 | | | | ☑ |
| 4 | | | | ☑ |
| 5 | | | | ☐ |

*** For FF and CC Containers a check under Sealed, shall mean a visual inspection of the container has been completed and there are no visible cracks, holes, gaps or other open spaces into the interior of the container when the cover and closure device is secured in the closed position. If the inspection is unsatisfactory, the containers will either be overpacked or transferred to the spent carbon storage tank within the first 24 hours of receipt.**

# WASTE ANALYSIS PLAN

# APPENDIX C

# ON-SITE SCREENING PROCEDURES

Revision ~~2~~4
~~March 2016~~October 2019

Evoqua Water Technologies

# Standard Methods for Screening Incoming Spent Carbon

## Scope and Application

Evoqua Water Technologies (EWT) will screen all incoming RCRA hazardous spent carbon to assure that the parameters in the fingerprint tests corresponds to the approved profile.

## Safety and Waste Handling

Procedures shall be carried out in a manner that protects the health and safety of all Siemens employees. When handling samples safety glasses and appropriate gloves must be worn. Gloves that have been contaminated will be removed and discarded. Exposure to chemicals must be maintained as low as reasonably achievable, therefore all samples must be opened and prepared in a fume hood. Waste containers will be kept closed unless transfers are being made.

Since the ignitability test requires the use of an open flame, keep the area clear of all other flammable materials.

All work must be stopped in the event of a known or potential compromise to the health and safety of Siemens employees.

## Summary of Methods

Fingerprinting tests include; physical inspection, ignitability, pH and compatibility of RCRA hazardous incoming spent carbon.

## Procedures

### Physical Inspection

Samples are visually inspected for the presence of material other than carbon such as rocks, debris, etc. Technician will determine if the carbon is aqua phase or vapor phase and document findings on the waste tally sheet.

## pH Test

In a beaker add a volume of deionized water that is equal to that of the carbon. Stir and let it stand for five seconds. Measure the pH using pH test strips. The color change is compared to the chart on the box and the value is documented on the waste tally sheet for review by plant management. If the pH is <3 or > 11, or outside the pH range of the profile notify your supervisor.

## Compatibility Test

After taking the pH of the carbon sample let the mixture stand for one minute and observe for reaction such as smoke, vapors or for an exothermal reaction. Results of this test are documented on the waste tally sheet for review by plant management. If any reaction occurs notify your supervisor.

## Ignitability Test

Check the ignitability of carbon by using a multi-purpose lighter and applying a flame directly to the carbon for 5 seconds. If the carbon burns and continues to sustain a flame it may be considered ignitable. If this occurs, mix the sample 50/50 with deionized water and reapply a flame for 5 seconds. If the liquid sustains a flame, the carbon will be deemed ignitable. Results of this test our documented on the waste tally sheet for review by plant management.

## Documentation and Record Keeping

Results are recorded on a waste tally sheet and signed by the technician performing the procedures. Plant management reviews results to determine if carbon is acceptable to be received into the plant.

# WASTE ANALYSIS PLAN

# APPENDIX D

# STANDARD OPERATING PROCEDURE FOR SULFUR AS SULFATE

Revision 4
October 2019

# Subpart BB Compliance Plan

Hazardous Waste Treatment, Storage and Disposal Facilities and Hazardous Waste Generators; Organic Air Emission Standards for Equipment Leaks

## Evoqua Water Technologies

Parker, Arizona

Revision 1~~0~~

July~~March~~ 2019

# Evoqua Water Technologies
# Subpart BB Compliance Plan
# Table of Contents



## List of Appendices

Evoqua Water Technologies

# Subpart BB Compliance Plan

## 1. Introduction

This document summarizes the air emission standards that apply to equipment leaks at the Evoqua Water Technologies (Evoqua), Parker, Arizona facility under the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Subpart BB regulations (40 CFR §264.1050 et. seq.), and provides the plan to assure compliance with these standards. As detailed below, the Subpart BB regulations specifically allow for compliance to be demonstrated through adherence to Clean Air Act (CAA) requirements in 40 CFR Parts 60, 61, and/or 63 (see 40 CFR §264.1064(m)). The Evoqua Parker, Arizona facility is subject to the National Emission Standards (NESHAP) for Benzene Waste, codified at 40 CFR Part 61, Subpart FF. Compliance with Subpart FF equipment leak standards together with the procedures described in this plan comprise the facility's Subpart BB compliance program.

This plan will be updated from time-to-time to reflect changes in applicability and compliance. The most recent version of the plan will be maintained onsite in the facility files.

## 2. Facility Description

The Parker, Arizona facility reactivates spent carbon from facilities that are both subject to and exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA).

## 3. Management Summary of Rule Requirements

Under Section 3004(n) of the authority of RCRA, the EPA has established standards to control air emissions from hazardous waste treatment, storage and disposal facilities as may be necessary to protect human health and the environment. Briefly, the EPA has established air emission standards for the following hazardous waste management units:

- Process Vents - referred to as Subpart AA regulations (codified at 40 CFR §264.1030, et seq.)
- Equipment Leaks[1] - referred to as Subpart BB regulations (codified at 40 CFR §264.1050, et seq.)
- Tanks, Surface Impounds and Containers - referred to as Subpart CC regulations (codified at 40 CFR §264.1080, et seq.)

None of the waste management units at the facility are subject to Subpart AA. Briefly, the facility is not subject to Subpart AA as there are no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping (§264.130). Compliance with Subpart CC is largely accomplished under the provisions of 40 CFR §264.1080(b)(7), which allows compliance to be demonstrated through the Clean Air Act provisions of 40 Parts 60, 61, and/or 63. Evoqua has prepared a separate plan addressing its procedures to assure ongoing compliance with Subpart CC.

The remainder of this document addresses Evoqua's specific compliance obligations under Subpart BB.

## 4. Evoqua Water Technologies Subpart BB Compliance Plan

### 4.1 Subpart BB Applicability

The Parker, Arizona facility complies with Subpart BB in large part via the provisions of 40 CFR 264.1064(m), which allows compliance under the CAA to satisfy Subpart BB obligations. EPA stated the following relative this approach:

"Paragraph §264.1064(m) in the recordkeeping requirements states that the owner or

1 The equipment regulated under Subpart BB include pumps, compressors, pressure relief devices, sampling connection systems, valves, open-ended valves or line, and flanges. These components shall be referred to as "Equipment" throughout this plan.

operator "…may elect to determine compliance with this subpart either by documentation pursuant to §264.1064 of this subpart [i.e., Subpart BB], or by documentation of compliance with the re
gulations at 40 CFR Part 60, Part 61, or Part 63." The corresponding Part 265 language is the same. The objective of the amendment was to eliminate any owner or operator burden caused by regulatory overlap. In making the revision to paragraph (m) in §2641064 and §265.1064 of Subpart BB, the Agency intended that, for a piece of equipment subject to equipment leak regulations under the CAA as well as RCRA Subpart BB, compliance with the CAA rules rather than the RCRA Subpart BB requirements would adequate demonstration of compliance with and in effect eliminate the need to demonstrate compliance under Subpart BB of the RCRA Air Rules."[2]

The Parker, Arizona facility is subject to NESHAP Subpart FF, a 40 CFR Part 61 CAA regulation, and satisfies its obligations under Subpart BB via compliance with the Subpart FF leak detection requirements. The facility has prepared a detailed compliance plan describing the applicable emissions standards, and the procedures to satisfy the testing, monitoring, recordkeeping, and reporting obligations under the FF standards.

Figure 1 provides a process flow diagram (PFD) identifying those portions of the facility that demonstrate compliance with Subparts BB and CC via Subpart FF. The figure also shows the processes and equipment potentially subject to Subpart BB (and Subpart CC), but that are exempt from the control standards based on the volatile organic (VO) concentration of the material in contact with the equipment. Finally, the figure also identifies those processes and equipment that are not in contact with hazardous waste and are therefore not subject to Subparts BB or CC standards (e.g., utilities, cooling water, etc.).

Evoqua considers all equipment subject to Subpart BB as also subject to NESHAP Subpart FF. Since the equipment is subject to Subpart FF, Evoqua does not implement the emissions or work practice standards embodied in Subpart BB. The leak detection and other methods described in Subpart FF satisfy Evoqua's monitoring and repair obligations under Subpart BB; Evoqua maintains records in accordance with the requirements of Subparts FF and BB. Appendix A provides a list of the equipment that is potentially subject to Subpart BB. This same list of equipment is also included in the Subpart FF compliance plan and is identified on appropriate Subpart FF inspection and recordkeeping forms.

## 4.2 Equipment Exempt from Subpart BB Standards

As shown in Figure 1, there are some portions of the facility that are not specifically regulated under the Subpart FF standards. Equipment that come in contact with hazardous waste, but are not specifically regulated under Subpart FF are potentially subject to Subpart BB. As demonstrated

2 See Page 5 of *CAA and RCRA Overlap Provisions in Subparts AA, BB, and CC of 40 CFR Part 264 and 265*, USEPA, RCRA Programs Branch, Region IV, Atlanta, GA, October 2000.

below, this equipment is not subject to Subpart BB because the equipment does not come in contact with hazardous waste with an organic concentration of at least 10 percent by weight (40 CFR §264.1050(b)), or the equipment is exempt from RCRA permitting. Specific equipment exempt from the Subpart BB standards include:

- Tank T-19 Tank System: This tank recirculates water to the packed bed scrubber and is the introduction point for makeup water added to the scrubber system. City water is used for makeup.

- Tank T-11 Tank System: This tank collects scrubber water blow down, cooling water blow down, boiler blow down and excess recycle water. This tank is part of the wastewater treatment system and is therefore exempt from RCRA permitting.

- Equipment Downstream of the Afterburner (AB-2): This equipment is downstream of AB-2 and includes the Gas Cooler/Venturi Scrubber (SC-11), the Caustic Packed Scrubber (SC-12), the Wet Electrostatic Precipitator (WESP-11), and the Exhaust Stack.

- Emission Capture and Control System Associated with the Spent Carbon Unloading Hoppers (Equipment associated with the Baghouse and WS-2): The unloading hoppers are vented to a baghouse and carbon canister control system. This baghouse and carbon canister system are designed to reduce carbon dust emissions and vapors incident to unloading into the unloading hoppers.

4.3 Subpart BB Exemption Procedures

Operator knowledge provides the basis to conclude that certain equipment is exempt from the provisions of Subpart BB. As per 40 CFR 264.1063(d), the facility provides the following documentation to support these exemptions:

- Equipment associated with Tanks T-11 and T-19: The organic concentration of wastes introduced and managed in these tanks is significantly below the 10% threshold. Tank T-11, which potentially contains more VO since it is in wastewater service, was tested during four sampling events. Multiple sampling events have demonstrated the VO concentration results are below 1 mg/l. The sampling results for these events are maintained at the facility.

- Equipment associated with Systems Downstream of the Afterburner (AB-2): Compliance with Subpart FF emission standards for control devices assures the exemption status of this equipment. Under Subpart FF, AB-2 must achieve 99+% benzene destruction efficiency. The benzene destruction efficiency is a good surrogate for VO that may be present in the exhaust stream. The exhaust stream from AB-2 contains parts per billion (ppb) levels of organics, well below the 10% threshold. Testing data are supporting this determination are maintained in the facility files.

- Equipment associated with the Emission Control System for the Spent Carbon Unloading Hoppers: Evoqua has monitored the vapor stream that is vented to the carbon canister control system (WS-2) with a Total Vapor Analyzer (TVA). The TVA detects all hydrocarbons that may be present in the stream and reports the value in the units of parts per million volume (ppmv), as methane. Test data collected at the facility over many years indicate that the total hydrocarbon concentration in the inlet vapor stream is less than 5 ppmv. ~~.~~ These data ~~is concentration value~~ in ppmv if converted to a mass basis (ppmw or ppm) would be less than 5 ppmw as well. Measured data demonstrating the exemption status of this equipment is maintained in the facility files; three years of recent sampling data are provided in Appendix B to this plan.

- All Other Equipment Shown in Figure 1: These systems do not come in contact with hazardous waste and are therefore not regulated under Subpart BB.

The facility must review, and as necessary, update its exempt status determinations for equipment potentially subject to Subpart BB whenever the owner or operate takes any action that could result in an increase in the total organic content of the waste contained in or contacted by equipment subject to the standards (see 40 CFR §264.1063(d)(3) and §264.1064(k)(3)). The facility conducts these analyses/determinations, as required.

### 4.4 Monitoring Requirements

The specific monitoring requirements applicable to equipment potentially subject to Subpart BB are detailed in the Subpart FF Compliance Plan.

### 4.5 Recordkeeping Requirements

The facility must maintain records to demonstrate compliance with Subpart BB. For equipment subject to Subpart BB, the facility maintains records in accordance with NESHAP Subpart FF. Please see the Subpart FF compliance plan for additional information (40 CFR §264.1064(m)). For equipment exempt from Subpart BB, please reference Section 4.3 regarding the records and other information used to demonstrate the exemption status of the equipment. Documentation of exempt status must be maintained in accordance with 40 CFR §264.1064(k).

### 4.6 Reporting Requirements

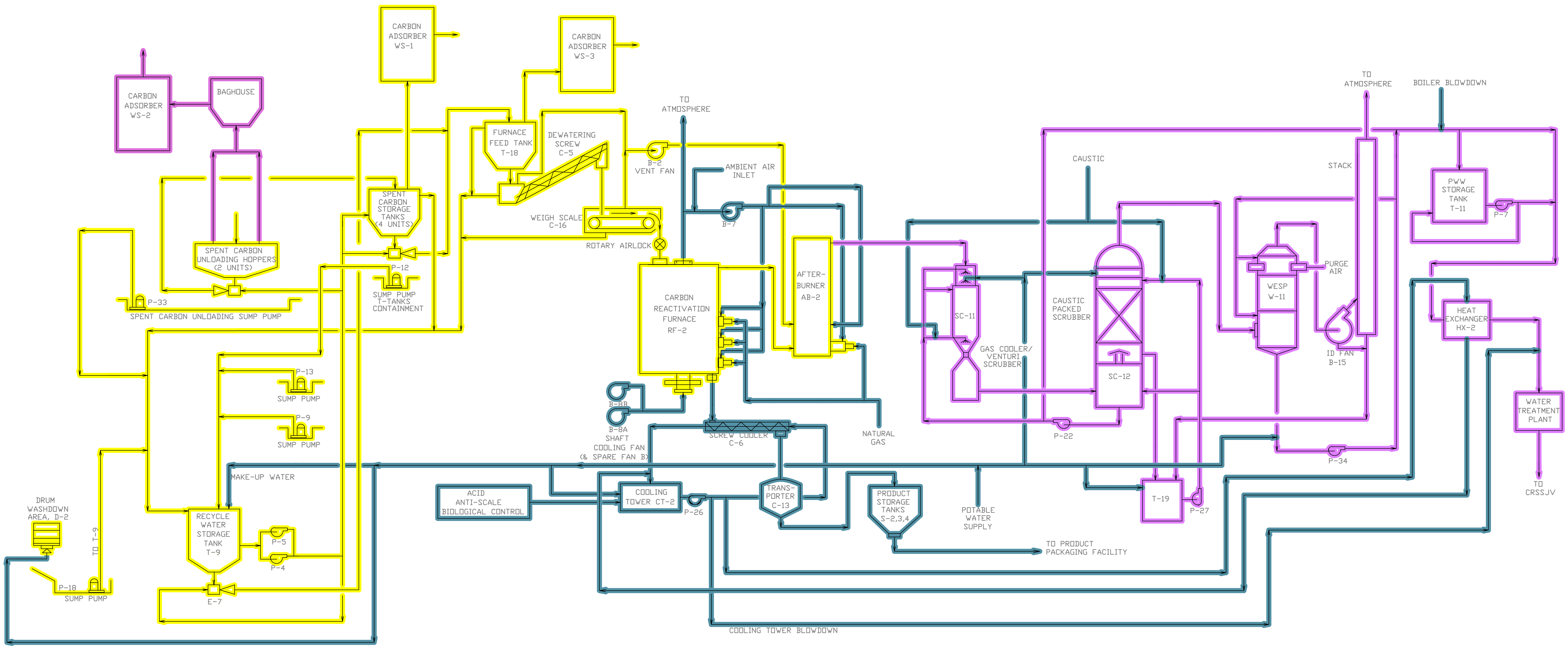
40 CFR §264.1065 details the semi-annual reporting obligations under Subpart BB. The semi-annual report must include the following:

- Information about leaks not repaired as per the requirements of Subpart BB;
- Dates of process unit shutdowns; and
- Information about exceedances related to the operation of control devices subject to the Subpart BB standards.

If during a reporting period any leaks from valves, pumps, and compressors are repaired as per the requirements of Subpart BB, and if Subpart BB control devices do not exceed or operate outside of design specifications (as defined in 40 CFR §265.1064(e)) for more than 24 hours, then no report is required (40 CFR §264.1065(b)).

Since the facility demonstrates compliance with Subpart BB via the requirements of Subpart FF, and that there are no equipment and control devices subject to the specific monitoring or control standards of Subpart BB, no reporting is required under Subpart BB. Notwithstanding this reporting exemption in Subpart BB, the facility is subject to certain reporting requirements in Subpart FF, as detailed in the Subpart FF compliance plan.

Appendix A
Equipment Subject to Subpart BB




SUBJECT TO NESHAP SUBPART FF

EXEMPT FROM SUBPARTS BB, CC, AND FF (SEE COMPLIANCE PLANS FOR BASES)

NOT SUBJECT TO SUBPARTS BB & CC (DOES NOT COME IN CONTACT WITH HAZARDOUS WASTE)

| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 0 | KAC | ATH | | UPDATED FROM PC-1466 PR-003 | 3-5-19 |

CBE CHAVOND-BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

PROCESS FLOW DIAGRAM
SUBPARTS BB, CC, AND FF APPLICABILITY

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 1/10/01 | KEM | 1/18/07 | | |

| SCALE | DWG. NO. | REV. |
|---|---|---|
| NONE | FIGURE 1 | 0 |

PRINT DATE: 3/7/19

### Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 1 | **H-1 Hopper Waste Feed Closed** | Visual and Method 21 Inspections, per Subpart FF |
| 2 | **H-1 Hopper Eductor Flanges and Victaulics** | |
| 3 | **H-1 Hopper Flanges, Piping and Victaulics** | |
| 4 | **H-2 Hopper Waste Feed Closed** | |
| 5 | **H-2 Hopper Eductor Flanges and Victaulics** | |
| 6 | **H-2 Hopper Piping and Victaulics** | |
| 7 | **RF-2 Hearth 1 Door West** | |
| 8 | **RF-2 Seal Welded Flat - between 1 and 2** | |
| 9 | **RF-2 Hearth 2 Door East** | |
| 10 | **RF-2 Seal Welded Flat - between 2 and 3** | |

*This list is updated from time-to-time based on equipment in service at the facility. See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 11 | RF-2 Hearth 3 Door East | Visual and Method 21 Inspections, per Subpart FF |
| 12 | RF-2 Seal Welded Flat - between 3 and 4 | |
| 13 | RF-2 Hearth 4 Door East | |
| 14 | RF-2 Seal Welded Flat - between 4 and 5 | |
| 15 | RF-2 Hearth 5 Door East | |
| 16 | RF-2 Welded Seam on Furnace Bottom | |
| 17 | RF-2 Top Sand Seal | |
| 18 | RF-2 Bottom Sand Seal | |
| 19 | RF-2 Carbon Outlet Piping and Flanges | |
| 20 | T-1 Ball Valves | |
| 21 | T-1 Couplings | |
| 22 | T-1 Eductor & Fittings | |
| 23 | T-1 Fill Slurry Lines & Vics From H-1, H-2 | |
| 24 | T-1 Fittings & Valves | |

*This list is updated from time-to-time based on equipment in service at the facility. See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

### Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 25 | **T-1 (SEE ATTACHMENT No. 1)** | Visual and Method 21 Inspections, per Subpart FF |
| 26 | **T-1 Pressure Relief Valve** | |
| 27 | **T-1 Slurry Line** | |
| 28 | **T-1 Tank Flanges** | |
| 29 | **T-1 Vent Pipe To WS-1** | |
| 30 | **T-2 Ball Valves** | |
| 31 | **T-2 Couplings** | |
| 32 | **T-2 Eductor & Fittings** | |
| 33 | **T-2 Fill Slurry Lines & Vics From H-1, H-2** | |
| 34 | **T-2 Fittings & Valves** | |
| 35 | **T-2 Tank (SEE ATTACHMENT No. 1)** | |
| 36 | **T-2 Pressure Relief Valve** | |
| 37 | **T-2 Slurry Line** | |
| 38 | **T-2 Tank Flanges** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 39 | **T-2 Vent Pipe To WS-1** | Visual and Method 21 Inspections, per Subpart FF |
| 40 | **T-5 Ball Valves** | |
| 41 | **T-5 Couplings** | |
| 42 | **T-5 Eductor & Fittings** | |
| 43 | **T-5 Fill Slurry Lines & Vics From H-1, H-2** | |
| 44 | **T-5 Fittings & Valves** | |
| 45 | **T-5 (SEE ATTACHMENT No. 2)** | |
| 46 | **T-5 Pressure Relief Valve** | |
| 47 | **T-5 Slurry Line** | |
| 48 | **T-5 Tank Flanges** | |
| 49 | **T-5 Vent Pipe To WS-1** | |
| 50 | **T-6 Ball Valves** | |
| 51 | **T-6 Couplings** | |
| 52 | **T-6 Eductor & Fittings** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 53 | **T-6 Fill Slurry Lines & Vics From H-1, H-2** | Visual and Method 21 Inspections, per Subpart FF |
| 54 | **T-6 Fittings & Valves** | |
| 55 | **T-6 (SEE ATTACHMENT No. 2)** | |
| 56 | **T-6 Pressure Relief Valve** | |
| 57 | **T-6 Slurry Line** | |
| 58 | **T-6 Tank Flanges** | |
| 59 | **T-6 Vent Pipe To WS-1** | |
| 60 | **T-9 (SEE ATTACHMENT No. 3)** | |
| 61 | **T-9 Level Transmitter** | |
| 62 | **T-9 Main Bottom Manway Door** | |
| 63 | **T-9 Return Line and Fittings From T Tanks** | |
| 64 | **T-9 Return Line and Fittings From T-18** | |
| 65 | **T-9 Sump Pump Fittings** | |
| 66 | **T-9 Vent Line and Fittings To WS-1** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

## Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 67 | T-9/P-4 Pump - Inlet Pipe and Fittings | Visual and Method 21 Inspections, per Subpart FF |
| 68 | T-9/P-5 Pump - Inlet Pipe and Fittings | |
| 69 | T-9/P-4 Pump - Outlet Pipe and Fittings | |
| 70 | T-9/P-5 Pump - Outlet Pipe and Fittings | |
| 71 | T-18 Feed Hose & Couplings | |
| 72 | T-18 Feed Valve & Piping | |
| 73 | T-18 Level Indicators | |
| 74 | T-18 Lids (SEE ATTACHMENT No. 4) | |
| 75 | T-18 Return Line, Couplings and Vics | |
| 76 | T-18 Piping and Couplings From T-Tanks | |
| 77 | WS-1 Hatches & Sample Port | |
| 78 | WS-1 Inlet | |
| 79 | WS-1 Outlet | |
| 83 | WS-3 Hatches & Sample Port | |

*This list is updated from time-to-time based on equipment in service at the facility. See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

### Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

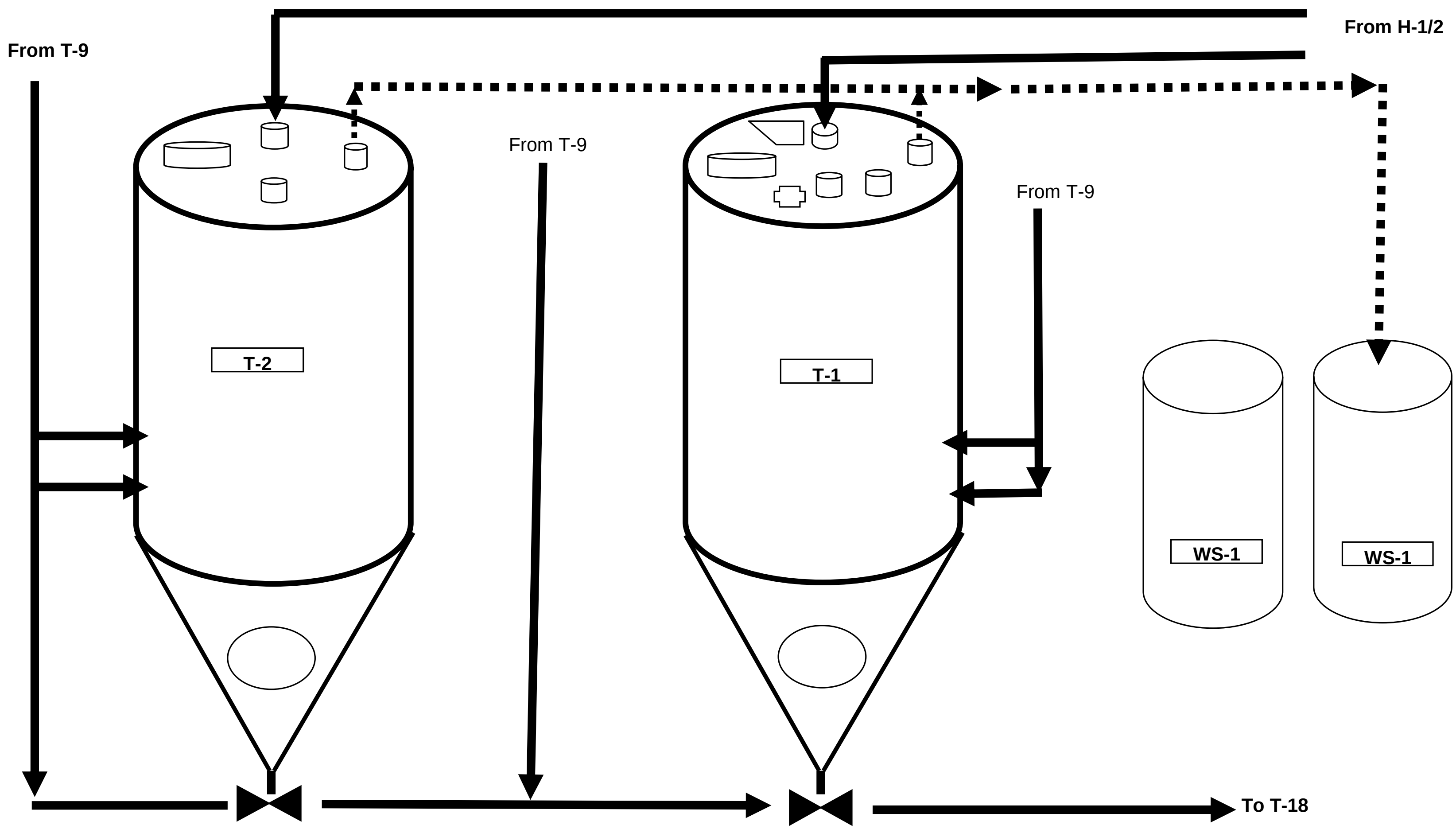
### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 84 | **WS-3 Inlet** | Visual and Method 21 Inspections, per Subpart FF |
| 85 | **WS-3 Outlet** | |
| 86 | **Dewater Screw (SEE ATTACHMENT No. 4)** | |
| 87 | **Weigh Belt Feeder (SEE ATTACHMENT No. 4)** | |
| 88 | **Rotary Valve (SEE ATTACHMENT No. 4)** | |

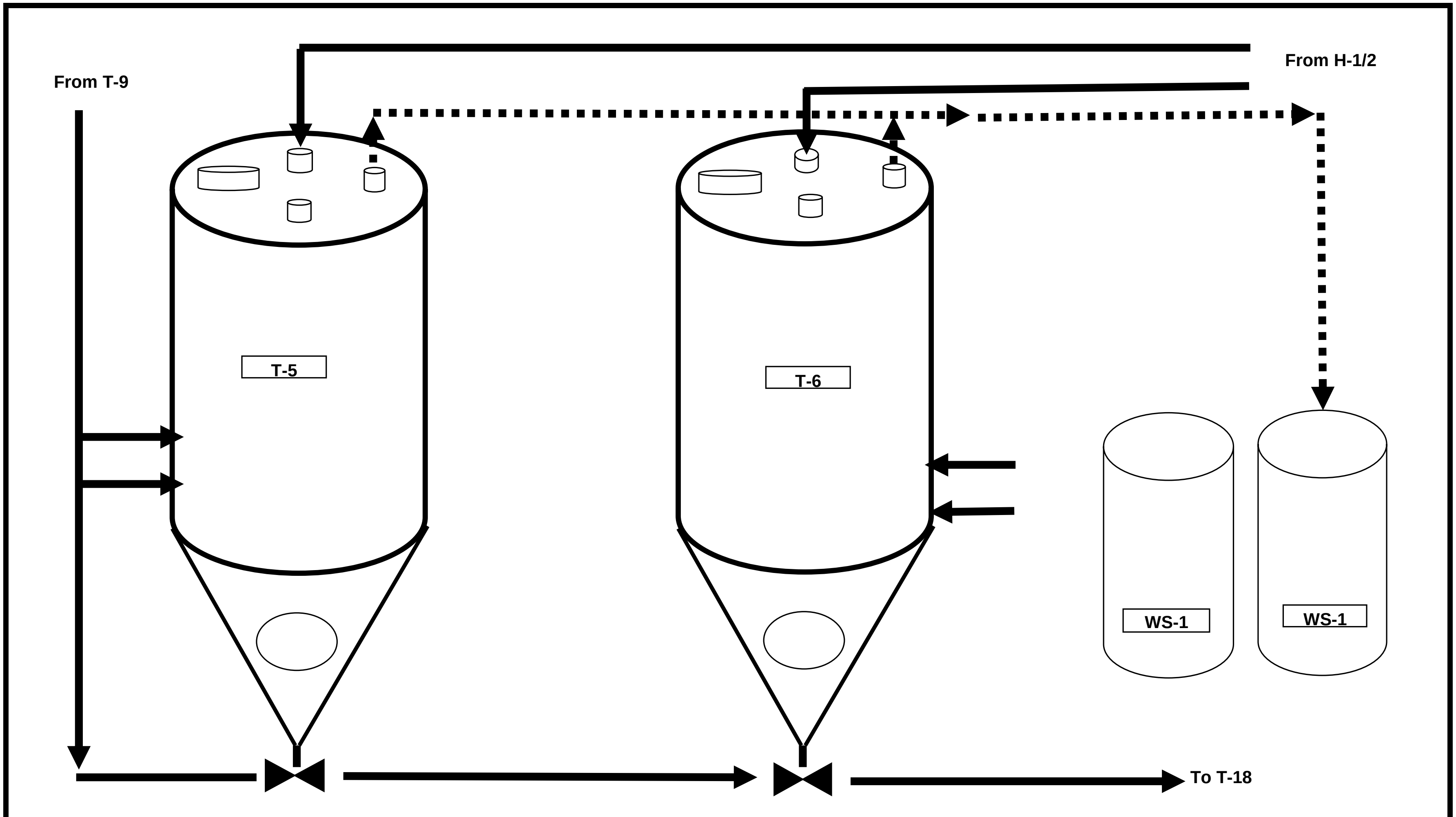
*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

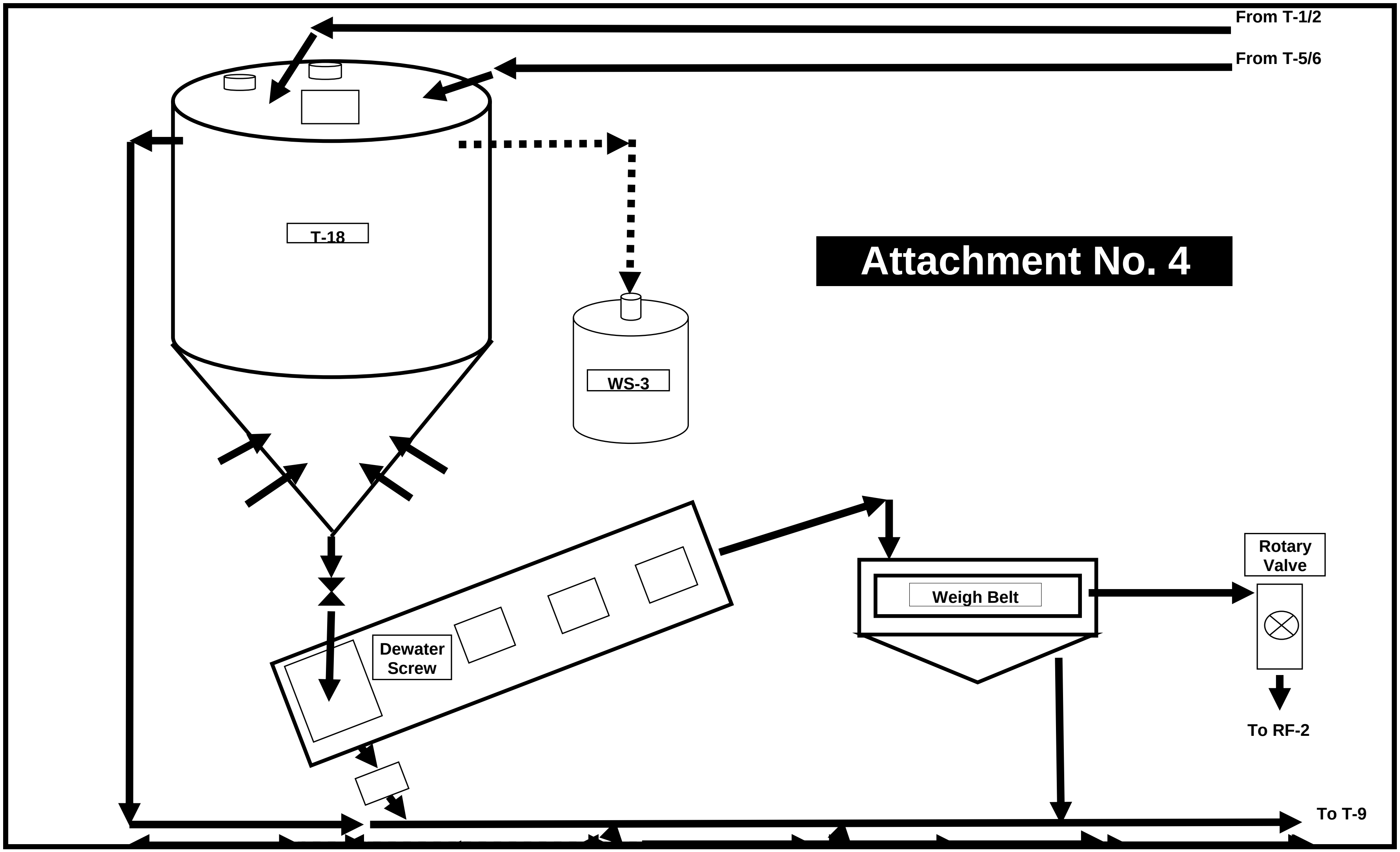
**Evoqua Water Technologies** **Parker Facility** **Component Inspection Diagrams**



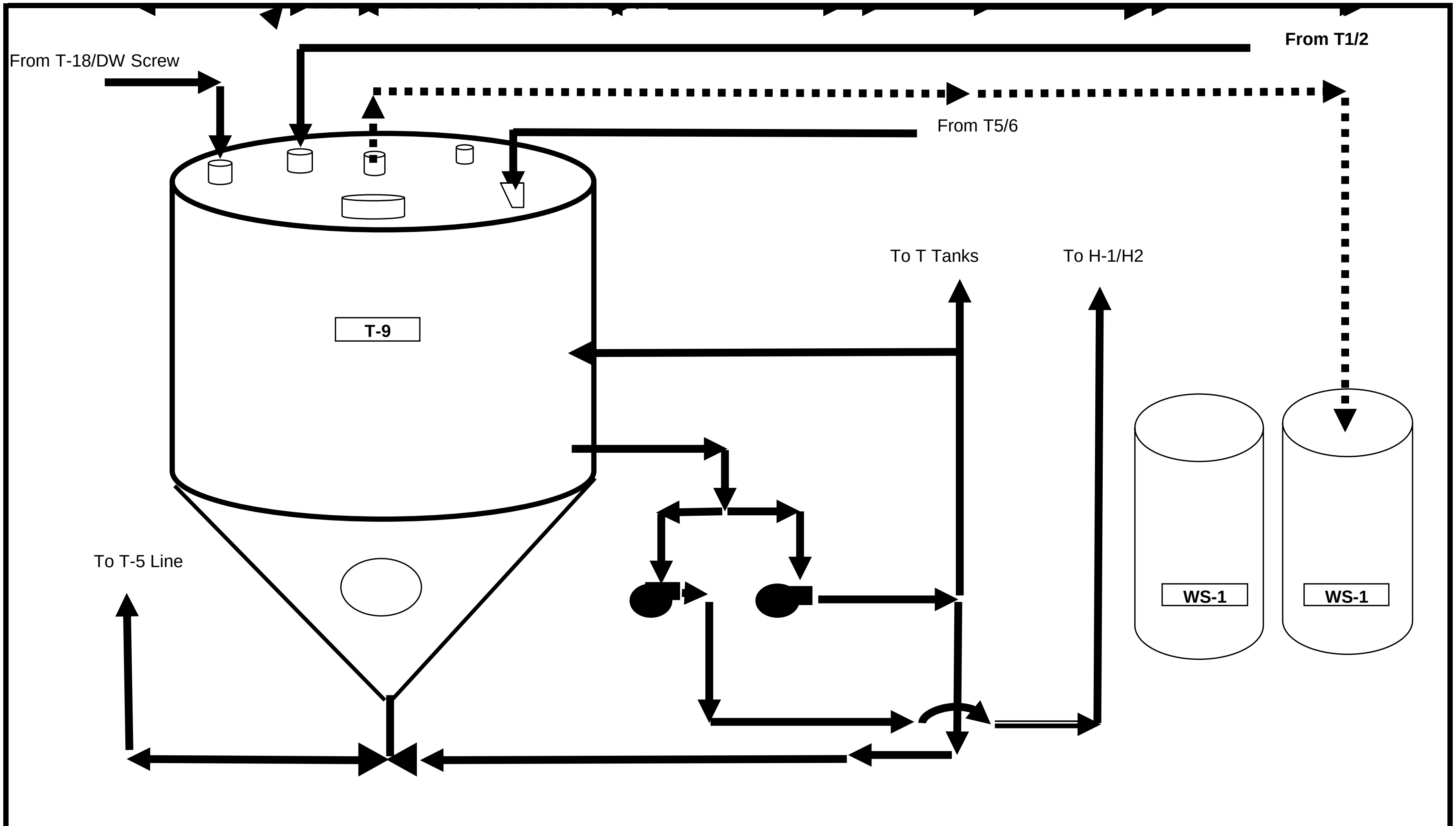

**Attachment No. 1**




**Attachment No. 2**


From T-1/2
From T-5/6
T-18
WS-3
Attachment No. 4
Dewater Screw
Weigh Belt
Rotary Valve
To RF-2
To T-9

Evoqua Water Technologies Parker Facility Component Inspection Diagrams




Attachment No. 3

Appendix B

Data to Support Subpart BB Exemptions

(See Line Item 85 in the attached records)

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

**Instrument Used: Foxboro TVA 1000 FID** **Tested By: Monte McCue August 24, 2016**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 8/24/2016 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 8/24/2016 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 8/24/2016 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 8/24/2016 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 8/24/2016 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 8/24/2016 | 4650 | NA | N | | | NA |
| 83 | WS-1 Outlet | 8/24/2016 | 5 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 8/24/2016 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By: Monte McCue August 16, 2017

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 8/16/2017 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 8/16/2017 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 8/16/2017 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 8/16/2017 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 8/16/2017 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 8/16/2017 | 3000 | NA | N | | | NA |
| 83 | WS-1 Outlet | 8/16/2017 | 25 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 8/16/2017 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By: Monte McCue July 19, 2018**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 7/19/2018 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 7/19/2018 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 7/19/2018 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 7/19/2018 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 7/19/2018 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 7/19/2018 | 3000 | NA | N | | | NA |
| 83 | WS-1 Outlet | 7/19/2018 | 25 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 7/19/2018 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

# PERMIT ATTACHMENT

# SECTION O

## SUBPART CC AIR EMISSION STANDARDS

Evoqua Water Technologies
2523 Mutahar Street
Parker, Arizona  85344

Revision 8
July 2019

TABLE OF CONTENTS



LIST OF CITED APPENDICES

## O.1 SUBPART CC AIR EMISSION STANDARDS

The Evoqua Water Technologies Parker facility manages all tanks and containers regulated by the requirements of Subpart CC as specified in Section O. The Subpart CC Compliance Plan is located in Appendix XX.

# PERMIT ATTACHMENT

# APPENDIX XX

# SUBPART CC COMPLIANCE PLAN

EVOQUA WATER TECHNOLOGIES
2523 Mutahar Street
PARKER, ARIZONA

Revision 8
July 2019

# Subpart CC Compliance Plan

Hazardous Waste Treatment, Storage and Disposal Facilities
and Hazardous Waste Generators; Organic Air Emission
Standards for Tanks, Surface Impoundments and Containers

## Evoqua Water Technologies

Parker, Arizona

Revision 8~~7~~

July~~March~~ 2019

# Evoqua Water Technologies
# Subpart CC Compliance Plan
# Table of Contents



List of Appendices

Evoqua Water Technologies

# Subpart CC Compliance Plan

## 1. Introduction

This document summarizes the applicable air emission standards that apply to tanks, surface impoundments and containers used to manage hazardous waste relative to the Evoqua Water Technologies, Parker, Arizona facility under the U.S. Environmental Protection Agency (EPA) final Subpart CC regulations (40 CFR §264.1080 et. seq.), and provides the plan to assure compliance with these standards. As discussed below, the Subpart CC regulations specifically exempt waste management operations performed in tanks and containers that comply with the National Emission Standards for Benzene Waste Operations promulgated by the EPA under the Section 112 of the Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAP), codified at 40 CFR Part 61, Subpart FF. This plan describes how the Subpart FF requirements are integrated into the overall compliance approach for the Subpart CC regulations. Records related to any deferral or exemption from Subpart CC due to compliance with Subpart FF are maintained onsite, as per 40 CFR §§264.1089(a) and (j).

This plan will be updated from time-to-time to reflect changes in applicability and compliance. The most recent version of the plan will be maintained onsite in the facility files.

## 2. Facility Description

The Parker, Arizona facility reactivates spent carbon from facilities that are both subject to and exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA).

## 3. Management Summary of Rule Requirements

Under Section 3004(n) of the authority of the Resource Conservation and Recovery Act (RCRA), the EPA has established standards to control air emissions from hazardous waste treatment, storage and disposal facilities as may be necessary to protect human health and the environment. Briefly, the EPA has established air emission standards for the following hazardous waste management units:

- Process Vents - referred to as Subpart AA regulations (codified at 40 CFR §264.1030, et seq.)
- Equipment Leaks from Pumps, Valves and Compressors - referred to as Subpart BB regulations (codified at 40 CFR §264.1050, et seq.)
- Tanks, Surface Impounds and Containers - referred to as Subpart CC regulations (codified at 40 CFR §264.1080, et seq.)[1]

None of the waste management units at the facility is subject to Subpart AA. Briefly, the facility is not subject to Subpart AA as there are no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping (§264.130). The facility is subject to Subpart BB. Compliance with Subpart BB is accomplished as described in a separate Subpart BB Compliance Plan.

This document addresses Evoqua's compliance obligations under Subpart CC. Relative to the Parker facility, the final Subpart CC regulations exempt all hazardous waste management units from all Subpart CC emission control, monitoring, sampling, testing, reporting and record

[1] Subpart CC regulations have a lengthy regulatory history. Briefly, the final standards were originally promulgated on December 6, 1994 (59 FR 69826). The final rule caused much confusion and met with substantial opposition from the regulated community. The effective date of the rule was extended on three separate occasions (60 FR 26828, May 19, 1995; 60 FR 56952, November 13, 1995 and 61 FR 28508, June 5, 1996); EPA issued three subsequent final interpretive ruling to clarify Subpart CC requirements and to request additional public comment (60 FR 41870, August 14, 1995 and 61 FR 4903, February 9, 1996 and 61 FR 59932, November 25, 1996).

keeping requirements provided the facility certifies that these waste management units are equipped and operated with air emission controls in accordance with the Benzene Waste Operations NESHAP (40 CFR §61.340, et seq.). The final Subpart CC standards allow compliance with Clean Air Act requirements to satisfy Subpart CC obligations at 40 CFR §264.1080(b)(7), which states:

> (b) The requirements of this subpart [Subpart CC] do not apply to the following waste management units at the facility:
>
> * * * * * * * * * * * * *
>
> (7) A hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR 60, 61 or part 63. For the purpose of complying with this paragraph, a tank for which the air emission control includes an enclosure, as opposed to a cover, must be in compliance with the enclosure and control device requirements of §264.1084(i), except as provided in §264.1082(c)(5).

Further, a tank or container for which all hazardous waste entering the unit has an average volatile organic (VO) concentration at the point of waste origination of less than 500 parts per million by weight (ppmw) is subject to Subpart CC, but is exempt from air emissions control requirements (§264.1082(c)). The average VO concentration is to be determined either by sampling and testing as directed by Subpart CC or by operator knowledge of the waste (§264.1083). If test data are used as the basis for knowledge, then the operator must document the test method, sampling protocol, and the means by which sampling and analytic variability are accounted for in determination of average VO concentration (§265.1084(a)(4)(ii), as referenced by §264.1083). Operators that rely on average VO concentration in a hazardous waste to exempt a unit from air emission controls must review and update, as necessary, this determination at least once every 12 months following the initial determination ((§264.1082(c)(1)).

Waste management units that contain hazardous waste with an average VO concentration greater than 500 ppmw (and are not subject to the Benzene Waste NESHAP) must comply with prescribed air emission control requirements, testing, monitoring and reporting provisions (§§264.1084-1087). Currently, only certain containers are subject to air control requirements of Subpart CC. As noted above, the compliance plan will be updated in the future to describe these control requirements should the applicability or exemption status of units at the facility change.

## 4. Evoqua Water Technologies Subpart CC Compliance Plan

This Subpart CC compliance plan addresses three types of waste management units:

- Waste management units (containers) that are regulated per Subpart CC requirements;
- Waste management units that are exempt from Subpart CC requirements because they are otherwise regulated under the Benzene Waste Operation NESHAP; and
- Waste management units that contain hazardous wastes that have a volatile organic (VO) concentration less than 500 ppmw at the point of waste origination, and are therefore exempt from the Subpart CC air emissions control requirements (§§264.1084-1087). Record keeping and monitoring requirements under Subpart CC apply to these units (§§264.1082(c)(1) and 1089(f)).

Compliance requirements for each of these categories of waste management units is discussed below.

### 4.1 Subpart CC Applicability

Figure 1 provides a process flow diagram (PFD) identifying those portions of the facility that demonstrate compliance with Subparts CC via Subpart FF. The figure also shows the processes and equipment potentially subject to Subpart CC, but are exempt from the standards based on exemptions under RCRA or the organic concentration (VO) of the material entering the waste management unit. Finally, the drawing shows equipment and systems that are exempt from Subparts CC (and Subparts BB and FF) because they do not come in contact with hazardous waste (e.g., utilities, cooling water, etc.). Further justification for the Subpart CC exemptions are provided below. Justifications for Subparts BB and FF exemptions are provided in their respective compliance plans.

In addition to Figure 1, the following two tables summarize the compliance requirements for waste management units potentially subject to Subpart CC. Table 1 lists the waste management units at the facility that are potentially subject to Subpart CC requirements but are instead regulated under Subpart FF, together with the applicable Benzene Waste NESHAP Subpart FF requirement to which they are subject. The Subpart FF references are provided because compliance with Subpart FF satisfies all compliance obligations under Subpart CC, as per 40 CFR §264.1080(a)(7). Table 2 lists the waste management units at the facility that are subject to Subpart CC control requirements as they are not regulated under Subpart FF.

Table 1
List of Waste Management Units and other Equipment that Comply with Subpart CC via Subpart FF

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART FF STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite - Subject to Subpart FF | §61.345 | Subpart FF wastes are stored in drums and other containers compliant with §61.345. Compliance with Subpart FF monitoring requirements are satisfied by the Generator. |
| N/A | Containers/Bins Storing Wastes Generated Onsite | §61.345<br>§61.342(f) | Benzene wastes shipped offsite must meet container and offsite shipment requirements. |
| H-1<br>H-2 | Spent carbon unloading hoppers, Nos. 1 and 2. | §61.346 | Both hoppers H-1 and H-2 receive spent carbon from containers and are managed as Subpart FF-affected units. |
| T-1 | Spent Carbon Storage Tank | §61.343 | Tank T-1 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-2 | Spent Carbon Storage Tank | §61.343 | Tank T-2 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-5 | Spent Carbon Storage Tank | §61.343 | Tank T-5 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-6 | Spent Carbon Storage Tank | §61.343 | Tank T-6 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART FF STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| T-9 | Recycle Water Tank | §61.343 | Tank T-9 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-18 | Furnace Feed Tank | §61.343 | Tank T-18 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-3). |
| RF-2<br>AB-2 | Reactivation Furnace No.2 and Afterburner No. 2 | §61.348 | Regenerated/reactivated carbon is a product and the Afterburner (AB-2) must meet 99+% benzene destruction efficiency. |
| C-5<br>C-16 | Dewater Screw and Weight Belt | §61.346(a) | Emissions routed to the Afterburner (AB-2) |
| WS-1 | Carbon Adsorber No.1 | §61.349 | Carbon canister, used to control volatile emissions from Tanks T-1, T-2, T-5, and T-6. |
| WS-3 | Carbon Adsorber No.3 | §61.349 | Carbon canister, used to control volatile emissions from Tank T-18. |

Table 2
List of Waste Management Units Subject to Subpart CC Control Requirements

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART CC STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite – Not Subject to Subpart FF | 40 CFR 264.1086(c) | All RCRA containers received at the facility are managed compliant with US DOT hazardous material packaging requirements - i.e., containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)) and equipped with a cover and closure devices that form a continuous barrier such that there are no visible holes, gaps or other open spaces. |

Tanks T-11 and T-19, which are not listed in Table 1 or Table 2, are exempt from Subpart CC based on RCRA permitting status or the VO concentration of the materials introduced to the tank.

Tank T-11 is not subject to Subpart CC because it is part of a tank system that constitutes a wastewater treatment unit and therefore it is exempt from RCRA permitting and RCRA Subtitle C standards pursuant to 40 CFR §270.1(c)(2)(v).

Tank T-19, which is part of the off-gas scrubber equipment, recirculates water to the packed bed scrubber and is the introduction point for makeup water added to the scrubber system. City water is used for makeup. This tank is exempt from CC controls based on the VO concentration of the water conveyed to this tank from the scrubber. Evoqua uses operator knowledge to make this determination, consistent with 40 CFR §264.1083(a)(2).

The next section addresses the container standards that are applicable to the facility.

4.2 Container Standards 40 CFR §264.1086 (c)

A variety of container types are used to store and manage spent carbon and other wastes at the facility. All of these containers, including bulk bags, drums, various types of spent carbon adsorption vessels, and other portable vessels, must meet the performance standards for containers in 40 CFR §264.1086 when managing Subpart CC regulated hazardous waste.

The general requirements for containers are as follows:

A. Containers with a design capacity less than or equal to 26.4 gallons are exempt from Subpart CC requirements. 40 CFR §264.1080(b)(2).

B. Containers with a design capacity greater than 26.4 gallons and no more than 119 gallons are subject to Level 1 controls.

C. Containers with a design capacity of greater than 119 gallons that are not in light material service are subject to Level 1 controls.

D. Containers with a design capacity of greater than 119 gallons that are in light material service are subject to Level 2 controls.

E. Containers with a design capacity of greater than 26.4 gallons that are used for treatment of a hazardous waste by a waste stabilization process are subject to Level 3 controls. The Facility does not treat hazardous waste in containers using a waste stabilization process and therefore Level 3 controls are not further discussed.

In light material service is defined as managing a material for which both of the following conditions apply: (i) the vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kPa at 20° C; and (ii) the total concentration of the pure organic constituents having a vapor pressure great than 0.3 kPa at 20° C is equal to or greater than 20 percent by weight. See 40 CFR §264.1081 and §265.1081.

Containers - Level 1 Controls

For containers subject to Level 1 controls, the Facility complies with Subpart CC as follows:

A. All Level 1 containers are subject to the following requirements:

(i) Level 1 containers must be compliant with US DOT hazardous material packaging requirements - i.e., these containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)); or

(ii) Level 1 containers must be equipped with a cover and closure devices that form a continuous barrier such that there are no visible holes, gaps or other open spaces.

B. All containers are inspected upon receipt (on or before the date of acceptance at the Facility, and repairs are conducted where defects are observed, as follows:

(i) visual inspections are conducted to ensure the containers are equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in a closed position there are no visible cracks, holes, gaps or other open spaces into the interior of the containers. 40 CFR §264.1086(c)(1)(ii) and 264.1086(c)(4)(i); and

(ii) visual inspections also confirm that the containers meet the applicable US DOT requirements on packaging hazardous materials for transportation in 49 CFR Parts 107, 172, 173, 178, and 180. 40 CFR §264.1086(d)(i) and 1086(f) see 40 CFR §264.1086(c)(1)(i)); and

(iii) where defects in containers are detected, the Facility makes first attempts to repair no later than 24 hours from detection and completes repair with as soon as possible and in any event within 5 calendar days, or alternatively transfers the waste to an intact container or tank.

C. Where containers are initially placed in service at the Facility, the inspection occurs when the cover is applied to the container. If containers were to remain in use at the Facility for a period of one year or more, the Facility would conduct a visual inspection at least once every 12 months as discussed in item A above. (Since storage of hazardous waste is currently prohibited for more than one year under the RCRA permit, these inspections are not anticipated.) See 40 CFR §264.1086(c)(4)(ii).

D. The facility's operating practice is to only open containers subject to Level 1 controls for the following reasons:

(i) to remove wastes in a continuous process until the container is RCRA empty (40 CFR §261.7(b)); or to remove waste in batches, in which case containers are closed upon completion of the batch removal for 15 minutes or if the operator leaves the immediate vicinity;

(ii) to perform routine activities other than waste transfer, provided that the containers are promptly closed; and

(iii) to open a safety device to avoid an unsafe condition.

Containers - Level 2 Controls

For containers subject to Level 2 controls, the Facility complies with Subpart CC as follows:

A. All Level 2 containers are subject to the following requirements:

(i) Level 2 containers must be compliant with US DOT hazardous material packaging requirements - i.e., containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)); or

(ii) Level 2 containers must be tested upon receipt to confirm that they operate with no detectable organic emissions as determined though Method 21.

B. All containers are inspected upon receipt (on or before the date of acceptance at the Facility), and repairs are conducted where defects are observed, as follows:

(i) visual inspections confirm that the containers are equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in a closed position there are no visible cracks, holes, gaps or other open spaces into the interior of the containers. 40 CFR §264.1086(d)(4)(i);

(ii) visual inspections also confirm that the containers meet the applicable US DOT requirements on packaging hazardous materials for transportation in 49 CFR Parts 107, 172, 173, 178, and 180. 40 CFR §264.1086(d)(i) and 1086(f); and

(iii) where defects in containers are detected, the facility makes first attempts to repair no later than 24 hours from detection and completes repair with as soon as possible and in any event within 5 calendar days, or alternatively transfers the waste to an intact container or tank. 40 CFR §264.1086(d)(4)(iii).

C. Where a container is initially placed in service at the facility, the inspection occurs when the cover is applied to the container. 61 Fed. Reg. 59947. If containers remain in use at the facility for a period of one year or more, the facility conducts a visual inspection at least once every 12 months as discussed in item B above. (Since storage of hazardous waste is currently prohibited for more than one year under the RCRA permit, these annual inspections are not anticipated.) 40 CFR §264.1086(d)(4)(ii).

D. All transfers of hazardous waste subject to Subpart CC out of a container is conducted to minimize exposure of the waste to the atmosphere, to the extent practical, considering the physical properties of the waste and good engineering and safety practices for handling the wastes.

Container Recordkeeping

Level 1 and Level 2 containers are subject to limited recordkeeping requirements under Subpart CC. The facility's Waste Tally sheet is used to document that the containers meet USDOT and visual inspection requirements.

## 4.3 Waste Management Units Exempt from Subpart CC Control Requirements

As summarized in Section 4.1, Tanks T-11 and T-19 are exempt from Subpart CC based on the tank's status as part of an exempt wastewater treatment unit (Tank T-11) and/or the concentration of the VO in the materials introduced to the tank (Tank T-19). With respect to Tank T-19, operator knowledge forms the basis for this exemption. If Evoqua is required to test waste streams to determine their VO concentration, the procedures set forth below apply.

The facility must review, and as necessary, update its VO determinations every 12 months (§264.1082(c)(1)). If the facility determines that sampling is required to update its determination, sampling would be performed in accordance with §§264.1083(a)(2) which is briefly summarized below:

- Identify and record the point of origination for the hazardous waste (§265.1084(a)(3), as referenced by §264.1083).

- Perform sampling pursuant to a sampling plan, and meet the following requirements:
  - Identification of where in the process the samples are to be taken.
  - The appropriate averaging period to be used to determine the average VO concentration in the sample. The averaging period cannot exceed one (1) year. Record the date, time and location that each sample is collected and maintain these data in the Subpart CC sampling plan.
  - The sample collection method used to minimize volatilization of organic compounds contained in the sample. At least four (4) samples are required to calculate the average volatile organic concentration.
  - The analytic methods used to determine concentrations of volatile organic compounds. Acceptable analytic methods include: Method 25D, Methods 8260(latest version) and 8270 (latest version) as defined in SW-846, Methods 624, 625, 1624 and 1625 as defined in 40 CFR Part 136. If any method aside from Method 25D is used, the facility must demonstrate that all target compounds in the sample are included amount those compounds listed by the EPA as ones for which the method is considered appropriate. If target compounds are not on this list, additional requirements will apply to the analytic methods (see §264.1083(a)(2). The sampling plan must include a quality assurance plan to document the specific procedures used to minimize loss of VO compounds due to volatilization, reaction, biodegradation, or sorption during the sample collection, storage, and preparation steps, and a measurement of the overall accuracy and precision of the specific procedures. Further, if analytic methods other than Method 25D are used, the facility may exclude those organics with a Henry's Law constant values less than 0.1 mole-fraction-in-the-gas-phase/mole-faction-in-the-liquid-phase. A list of all such compounds is included in Appendix VI to the final Subpart CC regulations.

A sampling plan is provided in Appendix A. Laboratory Standard Operating Procedures (SOPs) for the analytical methods are maintained onsite with the Facility's Subpart CC Compliance Plan. A list of these SOPs are provided in Appendix B.

## 4.4 Monitoring Requirements

The facility must perform the following monitoring of its operations:

- Assure that the facility complies with all applicable requirements as defined in the

Benzene Waste Operations NESHAP - Subpart FF.

- Review the waste determination for Tank T-19 on an annual basis, no later than December 4 of each calendar year (see §264.1082(c)(1)).

This section must be updated should either the exemption status of T-11 and/or T-19 change or if the applicability determinations for Subpart FF are modified.

4.5 Record Keeping Requirements

The facility must maintain the following records as part of the Subpart CC Plan:

- Maintain any sampling data for VO concentration determinations (see §264.1089(f)(1).

- Maintain container inspection records as described in Section 4.2.

This section must be updated should either the exemption status of T-11 and/or T-19 change or if the applicability determinations for Subpart FF be modified. As noted above, records related to any deferral or exemption from Subpart CC due to compliance with Subpart FF are maintained onsite, as per 40 CFR §§264.1089(a) and (j).

4.6 Reporting Requirements

Under the final regulations promulgated on November 25, 1996, Subpart CC applicability was amended to exempt any hazardous waste management unit that the facility certifies is equipped with and operating air emission controls in accordance with the Benzene Waste Operations NESHAP (Subpart FF). The notification and reporting provisions included in the final Subpart CC regulations do not specifically require that the facility send such a certification to the U.S. EPA (see §264.1090). However, to assure compliance with this revised applicability standard, the facility has made this certification in letter to the U.S. EPA, Region IX. A copy of this letter is attached at Appendix C~~B~~.

40 CFR §264.1090 outlines the reporting requirements applicable to RCRA permitted facilities. Reports are required to the EPA when:

1. A waste management unit reported to be exempt from the Subpart CC regulations that is no longer complying with the standard that exempted the unit (e.g., waste management unit that triggers applicability based on VO concentration).

2. A tank using Tank Level 1 air emission controls that is no longer complying with Level 1

control requirements; and

3. A control device subject to Subpart CC that has continuously operated in noncompliance with the applicable Subpart CC standards for a period of 24 hours or longer in any 6-month period.

The only reporting requirement that may be applicable to the facility would be Item 1. Reporting to EPA would occur if annual VO concentration determination demonstrated that the facility tanks T-11 and/or T-19 noted above were no longer exempt from the standards. These reports would be made within 15 days of becoming aware of the non-exemption status of the equipment.

Appendix A
Facility Sampling Plan

Appendix B
Laboratory Standard Operating Procedures for Analytical Methods
Complete SOP's Maintained Onsite

EPA Methods 5030B, 5030C and 5035 – SOP No. IR-MSV-Prep, Rev 3.1, Effective Date 5/30/2018

EPA Methods 8260B, 624 and TPH, SOP No. IR-MSV-8260_624, Rev 2, Effective Date 03/02/2015

EPA Methods 3510C, 608, 608.3, 3620C, 3630C, 3660B, and 3665A, SOP No. IR-EXT-3510, Rev. 3, Effective Date 09/18/2018

EPA Methods 8015B/8015D, IR-GVC-8015-GRO, Rev. 0.1, Effective Date 02/28/2019

EPA Methods 8270C and 625, SOP No. IR-MSS-8270_625, Rev 3, Effective Date 03/07/2016

EPA Methods 3520C and 625/625.1, SOP No. IR-EXT-3520C, Rev. 3, Effective Date 01/28/2019

EPA Methods 608 and 8082/8082A, SOP No. IR-GCS-PCBs, Rev. 4.1, Effective Date 05/10/2019

Appendix C~~B~~
December 3, 1996 Letter/Certification

# PERMIT ATTACHMENT

# APPENDIX XXIII

# SUBPART FF COMPLIANCE PLAN

EVOQUA WATER TECHNOLOGIES

PARKER REACTIVATION FACILITY

PARKER, ARIZONA

Revision 11
July 2019

# SUBPART FF
# COMPLIANCE PLAN

Revision 1~~0~~1 – ~~March~~July 2019

EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

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# 1. INTRODUCTION

This document summarizes the applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) for Benzene Waste Operations (Subpart FF) requirements and compliance plan for the Evoqua Water Technologies, Parker, Arizona facility. The main purpose of the document is to assist facility management and staff in understanding the relevant NESHAP Subpart FF requirements, and provide a tool for maintaining and tracking compliance documentation. Portions of the Facility's operations are also subject to RCRA Subpart CC and potentially Subpart BB, both of which control emissions of volatile organics, including benzene. Subparts BB and CC have provisions that allow compliance with Subpart FF in lieu of compliance with Subparts BB and CC. The Facility has chosen to implement the Subpart FF requirements where feasible in lieu of compliance with the control requirements of Subparts BB and CC.

The NESHAP regulations covered include:

- Subpart A - General Provisions (40 CFR 61.01, et seq.)
- Subpart FF - National Emission Standard for Benzene Waste Operations (40 CFR §61.340, et seq.)

Subpart A details the general provisions of the NESHAP regulations and applies to all facilities that trigger one or more of the emission standards outlined in the subsequent subparts. Subpart FF details the specific requirements for controlling benzene emissions from chemical manufacturing plants, petroleum refineries, and coke by-product recovery plants. This subpart also applies to facilities that treat wastes generated by facilities subject to Subpart FF; it is for this reason that the Parker, Arizona facility must comply with Subpart FF requirements (see §61.340(b)).

This document assumes that the total annual benzene quantity (TAB) for the Facility is less than 10 megagrams (Mg) per year. The Facility implements a TAB tracking system to closely monitor the facility TAB throughout the year, as changes to Facility practices, including additional controls, must be implemented before the Facility TAB equals or exceeds 10 Mg/yr.

The sections that follow describe the treatment processes at the Parker, Arizona facility, summarize the relevant rule requirements, and outline the facility's compliance plan.

# 2. FACILITY DESCRIPTION

The Parker, Arizona facility reactivates spent carbon from facilities that are subject to and facilities that are exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2[1]. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being

1 The baghouse and carbon adsorber WS-2 are not emissions controls regulated under Subpart FF because EPA has previously determined that the hopper is an "individual drain system" regulated under §61.346(b). These controls have been installed to mitigate potential dust and organic emissions from spent carbon unloading operations.

introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%. Under the language of Subpart FF and EPA guidance, the regenerated carbon is considered a product, not a waste. As such, the Facility is not required to demonstrate compliance with the benzene removal or destruction requirements in the regenerated carbon, provided the carbon is legitimately redeployed as a regenerated carbon product. The Facility confirms this by ensuring its regenerated carbon meets product specifications and is placed into inventory for reuse.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA) and is limited to a maximum spent carbon feed to the furnace of 3049 lb/hr.

Sources of potential benzene emissions from Subpart FF waste include:

- Carbon adsorbers (WS-1 and WS-3), which control spent carbon storage and furnace feed tank VOC emissions, including benzene.
- Emissions associated with the reactivation treatment unit (RF-2 and AB-2).
- Fugitive emissions from containers of Subpart FF waste.
- Fugitive emissions from drain lines and vent systems between regulated equipment.

The processes subject to Benzene NESHAP compliance are highlighted in the facility process flow diagram located in Appendix A.

## 3.0 MANAGEMENT SUMMARY OF RULE REQUIREMENTS

### 3.1 Applicability Criteria for Designation of Affected Facilities (40 CFR §60.340)

Subpart FF applies to chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries, and to treatment, storage and disposal facilities (TSDFs) that treat, store, or dispose, of hazardous wastes containing benzene generated by these facilities (e.g., the Facility) (see §61.340(a) and (b)). Because the Facility's TAB is less than 10 Mg/yr, it is subject only to TAB recordkeeping and reporting requirements under this section of the rule.

Subpart FF also applies to any facility that receives waste that is accompanied by a notice that the waste must be managed in accordance with Subpart FF (See 40 CFR §61.342(f)). The Facility receives wastes that have been designated as Subpart FF wastes under these provisions. All incoming wastes with a Subpart FF notice, including any subsequent mixtures of these wastes with any other materials, must be managed in compliance with Subpart FF requirements.

Incoming wastes from plants that are subject to Subpart FF (e.g., wastes from refineries, coke by-product recovery plants and chemical plants) which do not have a Subpart FF notice are presumed to not require Subpart FF controls at the Facility. If a generator provides a Subpart FF notice for a type of waste after prior shipments of that type have already been received, it is presumed that Subpart FF controls are required only from the date the Subpart FF notice is received.

## 3.2 Definitions (40 CFR 61.02 and 61.341)

Outlined below is a list of useful definitions that apply under NESHAP regulations. This list is not exhaustive and facility staff should reference the applicable subpart for additional information.

- Chemical Manufacturing Plant - any facility engaged in the production of chemicals by chemical, thermal, physical, or biological processes for use as a product, co-product, by-product, or intermediate including but not limited to industrial organic chemicals, organic pesticide products, pharmaceutical preparations, paint and allied products, fertilizers, and agricultural chemicals. See the definition at 40 CFR §61.341 for examples of some of the applicable process units.

- Capital Expenditure - An expenditure for a physical or operational change to a stationary source which exceeds a minimum threshold. The importance of the capital expenditure provisions is that modifications to existing facilities that result in an increase in emissions are not subject to NESHAP permitting requirements if the modifications can be accomplished without a “capital expenditure”. The difficulty with determining whether a modification triggers the “capital expenditure” threshold is that the Internal Revenue Service (IRS) guidelines cited by EPA as the means of making this determination are no longer published. EPA recognizes that the IRS form is no longer available, and intends to modify this definition. In the meantime, EPA uses the following definition:

  Capital Expenditure > (Original Equipment Cost)(0.07)

  Capital expenditures are analyzed on a per project basis to determine if a modification will result from a change in operation.

- Closed Vent System - A system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.

- Coke By-Product Recovery Plant - any facility designed and operated for the separation and recovery of coal tar derivatives (by-products) evolved from coal during the coking process of a coke oven battery.

- Commencement of Construction - Construction commences when an owner or operator has undertaken a continuous program of construction or modification, or when an owner has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification. Under a strict reading of this definition, construction commences when an owner signs a contract for the construction of a new or modified emission unit subject to NESHAP regulations. However, this is not how EPA applies this definition. EPA has issued guidance to the effect that construction commences when any component of an emissions unit subject to NESHAP is affixed to a foundation. Under this guidance, the laying of a foundation or permanent installation of piping or electrical conduit associated with a NESHAP source is considered to be commencement of construction. Notably, EPA does allow the shipment of pre-fabricated equipment to a site, provided that equipment is not affixed to a foundation upon arrival at the NESHAP facility.

- Construction - Fabrication, erection, or installation of a facility subject to NESHAP regulations. More notably, construction of a facility subject to NESHAP regulations cannot be commenced without written approval from EPA or a delegated state that has been delegated that authority.

- Container - Any portable waste management unit in which a material is stored, transported, treated, or otherwise handled. Examples of containers are drums, barrels, tank trucks, dumpsters, tank cars, and dump trucks.

- Cover - A device or system which is placed on or over a waste placed in a waste management unit so that the entire waste surface area is enclosed and sealed to minimize air emissions. A cover may have openings necessary for operation, inspection, and maintenance of the waste management unit such as access hatches, sampling ports, and gauge wells provided that each opening is closed and sealed when not in use. Examples of covers include a fixed roof installed on a tank, a lid installed on a container, and an air-supported enclosure installed over a waste management unit.

- Individual Drain System – A system used to convey waste from a process unit, product storage tank, or waste management unit to a waste management unit. This term includes all process drains and associated sewer lines down to the receiving waste management unit.

- No Detectable Emissions - Less than 500 parts per million by volume (ppmv) above background levels, as measured by a detection instrument reading in accordance with the procedures specified in §61.355(h) of this subpart.

- Modification - Any physical or operational change to an existing facility that results in an increase in the emission rate to which a NESHAP regulation applies. The following changes are not considered modifications:

    - Maintenance, repair, and routine replacement, if such physical change does not increase the maximum potential to emit of a pollutant to which NESHAP regulations apply.

- An increase in production rate (i.e., feed rate) if that increase can be accomplished without a capital expenditure.
- An increase in the hours of operation.

The relocation or change in ownership of a stationary source. However, such activities must be reported to EPA, as discussed in Section 3.4 below.

- Petroleum Refinery - any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives.
- Point of Waste Generation - The location where the waste stream exits the process unit component or storage tank prior to handling or treatment in an operation that is not an integral part of the production process, or in the case of waste management units that generate new wastes, the location where the waste stream exits the waste management unit component.
- Tank - A stationary waste management unit that is designed to contain an accumulation of waste and is constructed primarily of non-earthen materials which provide structural support.
- Total Annual Benzene Quantity (TAB) - the sum of the annual benzene quantity for each hazardous waste stream from a chemical manufacturing plant, a coke by-product recovery plant, or a petroleum refinery received at the Facility that has a flow-weighted annual average water content greater than 10 percent or that is mixed with water, or other wastes, at any time and the mixture has an annual average water content greater than 10 percent, calculated in accordance with 40 CFR §61.355.
- Waste - Any material resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged.
- Waste Management Unit – A piece of equipment, structure, or transport mechanism used in handling, storage, treatment, or disposal of waste. Examples of a waste management unit include a tank, surface impoundment, container, oil-water separator, individual drain system, steam stripping unit, thin-film evaporation unit, waste incinerator, and landfill.
- Waste stream - The waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, benzene concentration, water content) are determined at the point of waste generation. Examples of

a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate.

3.3 Approval for New and Modified Facilities (40 CFR §§61.07 - 61.08)

Prior to commencement of construction or modification of a facility subject to NESHAP regulations, an owner or operator must submit an application to EPA or its delegated administrator. For the Parker, Arizona facility, the application should be submitted to EPA Region IX at the following address:

Elizabeth Adams (or her successor)
Director, Air and Toxics Division (AIR-3-~~1~~)
United States Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

The contents of the application should include:

- The name and address of the applicant.
- The location of the proposed source.
- Technical information describing the proposed nature, size, design, operating design capacity, and method of operation, including a description of any equipment to be used to control emissions. Such technical information shall include calculations of emissions in sufficient detail so that EPA can assess the validity of the calculations and determine compliance with the applicable standards.
- Applications for modifications should also include a description of the proposed nature of the changes, the productive capacity of the facility before and after the changes are completed, and calculations of emissions before and after the changes are completed. The calculations should be in sufficient detail so that EPA can validate them and determine compliance with applicable standards.

After submittal of the application, EPA Region IX will determine if the application is complete. If deemed complete, EPA will notify the applicant within 60 days of its intention to approve or deny the application. If EPA determines that the new or modified source will comply with the applicable NESHAP standards, construction will be approved.

Construction may be commenced as soon as EPA issues its approval of the application.

3.4 Notifications (40 CFR §§61.09, 61.10, 61.13(c), and 61.342(f))

The following written notifications shall be submitted to EPA Region IX:

- Anticipated start-up notification. This notification shall be provided no more than 60 days nor less than 30 days before start-up.

- Actual start-up notification. The notification of actual start-up shall be submitted within 15 days after the date of start-up.
- Existing source notification. This notification should have been submitted by April 7, 1993. The contents of this notification are outlined in 40 CFR 61.10
- Change in information notification. If any of the information provided in an application or in the existing source notification is changed even though the change does not constitute a modification (e.g., change in ownership, address, etc.), a notification shall be submitted within 30 days after the change.
- Emission testing notification. This notification should be submitted at least 30 days prior to testing.
- Subpart FF waste disposal notification. If Subpart FF wastes are shipped offsite for treatment at another facility, a notification must accompany each shipment stating that the wastes contain benzene that is required to be managed and treated in accordance with the provisions of Subpart FF (See 40 CFR §61.342(f)).

### 3.5 General Standards for Treatment Facilities (40 CFR §61.348)

The facility shall treat the waste received from Subpart FF waste generators to at least one of the following standards:

1. Remove benzene from the waste stream to a level less than 10 ppmw on a flow weighted annual average basis. The reduction of benzene concentration by dilution is not allowed [§61.348(a)(1)(I)].
2. Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)].
3. Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)].
4. Return the waste to a process to generate a new product [§61.342(c)(1)(iii)].

Under the language of Subpart FF and EPA guidance, the regenerated carbon is considered a product, not a waste. As such, the Facility is not required to demonstrate compliance with the benzene removal or destruction requirements in the regenerated carbon, provided the carbon is legitimately redeployed as a regenerated carbon product. The Facility confirms this by ensuring its regenerated carbon meets product specifications and is placed into inventory for reuse. However, all equipment used to manage the spent carbon up to and including the multiple hearth and afterburner must be managed in accordance with Subpart FF equipment standards. These standards are set forth in 40 CFR §61.343 through §61.349 (as applicable). The requirements for each type of equipment are covered in the following section except for surface impoundments and oil-water separators, which are not present at the Facility.

The Facility may occasionally generate a wastewater from the discard of motive water used in the Facility's production process to slurry incoming spent carbon prior to reactivation. The motive water is assumed to become a waste at the point that the Facility determines it is no longer useable for its intended purpose. At that point of waste generation, if the wastewater has a flow-weighted annual average benzene content of less than 10 ppmw, then it is exempt from further control requirements under §61.342(c)(2). If the flow-weighted annual average benzene concentration of discarded motive water is 10 ppmw or greater, the wastewater would need to be treated using a control device regulated by Subpart FF to achieve either a benzene content below 10 ppmw on a flow weighted annual average or 99% or more benzene removal on a mass basis, pursuant to §61.348(a)(1)(i) or (ii), or sent to a facility with a 61.342(f) notice that Subpart FF treatment is required.

All access doors or other potential openings shall be sealed and kept closed at all times when waste is being treated, except during inspection and maintenance. Visual inspections of each sealed opening shall be performed initially and quarterly thereafter to ensure that no cracks or gaps occur and that openings are sealed closed. All repairs of any identified gaps or broken seals shall be made within 15 days. Repairs may be delayed until the next unit shutdown if they cannot be completed without a partial or complete facility shutdown.

Facilities complying with standards numbered one and two above must also comply with the standards of 40 CFR §61.343 through §61.347, and §61.349 (if applicable). These sections provide the requirements for tanks, containers, surface impoundments, individual drain systems, oil-water separators, and closed vent systems. Since the Parker, Arizona facility does not operate surface impoundments and oil-water separators subject to NESHAP regulations, these requirements will not be covered in the following section.

3.6 Standards for Tanks, Containers, Individual Drain Systems and Closed Vent Systems (40 CFR §§61.343, 61.345, 61.346, and 61.349)

Table 1 summarizes the equipment design, inspection, and repair requirement outlined in 40 CFR 60.343, 61.345, 61.346 and 61.349. These standards apply to:

- Tanks
- Containers
- Individual Drain Systems
- Closed Vent Systems
- Control Devices

Defects or other problems detected during equipment inspections must be corrected within the time frames outlined in Table 1. Repair may be delayed until the next facility shutdown if it is technically infeasible to make the repair or correction without a partial or complete facility shutdown.

Table 1 – Summary of Subpart FF Requirements

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| Tanks (§61.343) | Fixed roof connected by closed vent to a control device; all potential openings shall be sealed closed except during inspection, repair, maintenance, removal, or sampling; the closed vent system and control device shall meet the requirements of §61.349 (discussed below). | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | 45 days |
| | Fixed roof with pressure relief device maintained in a closed position except during relief events (limitations apply, see note below). | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | 45 days |
| Note: | A tank may be operated without a closed vent system if:<br>1) average water content is less than 10% by volume and maximum organic vapor pressure is less than 0.75 psia;<br>2) maximum organic vapor pressure is less than 4.0 psia and tank capacity is less than 40,000 gallons; or<br>3) maximum organic vapor pressure is less than 11.1 psia and tank capacity is less than 20,000 gallons. | | | |
| Containers (§61.345) | All containers shall remain sealed closed except during periods of loading, unloading, inspection, or sampling; liquids pumped into a container must be done with a submerged fill pipe. | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv for containers >111 gallons | Initial and quarterly visual inspections; Annual Method 21 inspections. | 15 days |
| Note: | Wastes treated within containers must be equipped with a closed vent system meeting the requirements of §61.349 (discussed below). Containers shipped offsite for treatment must meet the notification requirements of §61.342(f). | | | |

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| Individual Drain Systems (§61.346) | Compliance option of §61.346(a): Each individual drain system opening must be equipped with a closed vent system and control device. Compliance option of §61.346(b): Each drain must be equipped with water seal controls or a tightly sealed cap or plug; each sewer line shall be covered or enclosed with no visual gaps or cracks. | Visual inspection for cracks and broken seals.<br><br>Method 21 to verify fugitive emissions <500 ppmv | Initial and quarterly visual inspections. Initial and annual Method 21 inspections. | 15 days |
| Treatment Processes (§61.348) | Each treatment process must remove benzene to < 10 ppmw (dilution is not allowed), or remove or destroy benzene by ≥ 99 wt%; each treatment process must comply with the standards of §§61.343 - 61.347; compliance must be demonstrated either by engineering calculations (§61.356(e)) or performance tests (§61.355); all potential openings shall be sealed closed except during inspection and maintenance or return waste to a process to generate a new product (§61.342(c)(1)(iii). | Visual inspection for cracks and broken seals; inspection of units according to §§61.343 - 61.347. | Initial and quarterly visual inspections; inspection of units according to §§61.343 - 61.347. | 15 days |
| Closed-vent Systems and Control Devices(§61.349) | The vent system shall remain closed and connected to a control device; bypass lines shall have a flow indicator or a car-seal or lock-and-key seal; all gauging and sampling devices shall be gas-tight except when gauging or sampling; control device must be monitored according to §61.354(c) (see note below); control device must be operated at all times when waste is present, except for maintenance and repair requires shutdown; | Visual inspection; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | First attempt: 5 days; Full repair: 15 days. |
| | An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) must: reduce organic emissions by 95 wt%; achieve organic concentration ≤ 20 ppmv, corrected to 3% oxygen; or provide minimum residence time of 0.5 sec at minimum temperature of 760°C; vent must be introduced into flame zone of boiler or process heater (§61.349(a)(2)(i)). | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| | A vapor recovery system (e.g., carbon adsorption system or condenser) must: recover or control organic emissions by 95 wt%, or recover or control benzene emissions by 98 wt%; carbon canisters must be replaced immediately upon breakthrough (§61.349(a)(2)(ii)). | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |
| | Any other control device must achieve organic control of 95 wt% or benzene control of 98 wt%. | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |
| Note: §61.354(c) specifies the following required monitoring of operations for control devices subject to §61.349; the data recorded by the monitoring equipment must be inspected at least once each operating day to ensure proper operation of the control device, which in pertinent part are as follows:<br>(1) for a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder;<br>(2) for a control device subject to §61.349(a)(2)(iv) (other devices), devices to monitor the parameters specified in §61.349(a)(2)(iv)(C); and<br>§61.354(d) specifies the required monitoring of carbon adsorption systems that do not regenerate the carbon bed directly on site (e.g., carbon canisters): organic or benzene outlet concentrations shall be monitored daily, or at intervals no greater than 20% of the design carbon replacement interval (whichever is greater), to indicate when breakthrough has occurred or replace carbon earlier than the design breakthrough period. | | | | |

### 3.7 Compliance Demonstration (40 CFR §§61.13, 61.355, and 61.356(e) - (f))

Subpart FF requires the owner or operator to demonstrate compliance with the applicable general standards for waste treatment facilities and the applicable standards for closed vent systems and control devices. Compliance may be demonstrated either through engineering calculations or performance testing, which are discussed in turn below.

#### 3.7.1 Engineering Calculations (40 CFR §61.348(c)(1))

Compliance with the general standards for waste treatment facilities [§61.348(a)(1)(I) - (iii)] may be demonstrated with engineering calculations. These calculations must demonstrate compliance at maximum waste flow rate and maximum benzene content conditions and be available prior to facility start-up. As discussed in Section 3.9, these calculations shall be maintained for the life of the facility and include all supporting technical information (e.g., design specifications, drawings, etc.). See 40 CFR 61.356(e)(2) for additional information.

Carbon canisters and their associated closed vent systems must meet specific calculation requirements of 40 CFR 61.356(f)(2)(i)(G). Briefly, this analysis must consider the vent stream composition, benzene and constituent concentration, flow rate, relative humidity, and temperature. Based on these data, the operator must calculate the effective control capacity of the carbon canister and define the appropriate replacement interval to assure that the carbon canister maintains its control effectiveness.

For the afterburner, the specific calculation requirements are set forth in 40 CFR §61.356(f)(2)(i)(A). In general, this analysis must consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

#### 3.7.2 Performance Testing (40 CFR §61.348(c)(2))

If emissions testing is used to demonstrate compliance, the tests must be performed within 90 days of start-up for new units, or April 7, 1993 for existing units. Additionally, the EPA can at anytime require that such testing be performed to demonstrate compliance with Subpart FF requirements [40 CFR 61.13(b)]. The results of the emissions tests shall be reported to EPA Region IX within 31 days following the completion of testing. As discussed in Section 3.9, the results should be retained for the life of the facility.

The specific source tests that may be performed in lieu of engineering calculations are as follows:

| COMPLIANCE STANDARD | TEST METHODS REFERENCE |
|---|---|
| Remove benzene to a 10 ppmw concentration [§61.348(a)(1)(i)] | See §61.355(d) |
| Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)] | See §61.355(e) |
| Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)] | See §61.355(f) |
| Meet control device performance requirements specified in §61.349(a)(2) | See §61.355(i) |

### 3.7.3 Method 21 Testing (40 CFR §61.355(h))

All inspections performed using an organic vapor analyzer (OVA) shall be performed consistent with the requirements of EPA Method 21 from Appendix A of 40 CFR 60. Calibrations and testing shall also be performed consistent with 40 CFR 61.355(h).

## 3.8 Monitoring of Operations (40 CFR §§61.14 and 61.354)

Compliance monitoring must be performed as outlined below:

| COMPLIANCE STANDARD | MONITORING METHODS AND FREQUENCY |
|---|---|
| Remove benzene to a 10 ppmw concentration [§61.348(a)(1)(I)]. | Sample exiting streams on a monthly basis using the methods prescribed by §61.355(c); or, monitor a parameter or parameters on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |
| Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)]. | Monitor a parameter or parameters on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |
| Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)]. | Monitor a parameter or parameters (e.g., temperature) on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |

| COMPLIANCE STANDARD | MONITORING METHODS AND FREQUENCY |
|---|---|
| Meet control device performance requirements for carbon canisters as specified in §61.349(a)(2) | Replace canister at a specified interval as determined through engineering calculations; or, monitor the VOC content in the exhaust on a daily basis or at an interval not to exceed 20% of the design carbon replacement interval. |

## 3.9 Recordkeeping Requirements (40 CFR §61.356)

All records required by Subpart FF shall be maintained in a readily accessible location at the facility site for a period not less than two years, unless otherwise specified below. The records that must be maintained include:

- A list of the streams subject to Subpart FF compliance and whether or not the waste stream is controlled for benzene emissions (§61.356(b)).
- For each waste stream not controlled in accordance with Subpart FF, all test results and other documentation used to define the stream identification, water content, whether or not the waste stream is process wastewater, annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity (§61.356(b)(1)).
- For each waste shipment sent offsite for treatment, the date the waste is shipped offsite, quantity of waste shipped offsite, the name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment (§61.356(c)).
- Engineering design documentation for all control equipment. The documentation should be retained for the life of the facility (§61.356(d)).
- A signed and dated statement certifying that the treatment unit is designed to operate at the documented performance level when the waste stream entering the facility is at the highest flow rate and benzene concentration. This signed statement should be retained for the life of the facility (§61.356(e)(1)).
- For closed-vent systems and control devices, a signed and dated statement certifying that each system and device is designed to operate at the documented performance level when the waste management unit vented to the control device is or would be operating at the highest load or capacity expected to occur. This signed statement must be retained for the life of the unit (§61.356(f)).
- If engineering calculations are used to demonstrate compliance with the general standards for treatment facilities [§61.348(a)(1)(I) - (iii)], a complete design analysis that includes supporting technical information (e.g., design specifications, etc.) should be maintained for

the life of the facility (§61.356(e)(2)).

- For all performance test results used to demonstrate compliance with the general standards for treatment facilities [§61.348(a)(1)(I) - (iii)], maintain for the life of the facility the documentation required in 40 CFR §61.356(e)(3).

- A signed and dated statement certifying that the closed vent system and control device is designed to operate at the documented performance level at the highest load or capacity expected to occur (§61.356(f)(1)).

- If engineering calculations are used to determine control device performance, then a design analysis should be retained for the life of the control device that includes specifications, drawings, and other documentation supporting the calculations. For carbon canisters, the design analysis should include information required in 40 CFR §61.356(f)(2)(I)(G).

- For all test results used to determine control device performance, maintain testing results for the life of the control device as outlined in 40 CFR §61.356(f)(3).

- Visual inspection records that include the date of each inspection, the treatment unit or control equipment inspected, description of any problem identified, a description of the corrective action taken, and the date the corrective action was completed (§61.356(g)).

- Method 21 inspection records that include the dates of inspection, background level measured, and the maximum concentration measured at each potential leak interface. If a leak is detected, then the records shall include the location where the leak was detected, a description of the problem, a description of the corrective action taken, and the date the corrective action was completed (§61.356(h)).

- Dates of start-up and shutdown of the treatment unit, and periods when the treatment unit is not operating as designed (§61.356(i)(1) & (5)).

- Dates of start-up and shutdown of the closed-vent system, and periods when the closed-vent system is not operating as designed (§61.356(i)(1) & (3)).

- Testing results from all monthly waste stream sampling performed in accordance with 40 CFR §61.354(a)(1). The results should also include the date each test is performed (§61.356(i)(2)).

- Descriptions of any process parameters that are monitored to ensure the treatment unit is operating in compliance with Subpart FF. The descriptions should include reasons why the parameter(s) was/were selected. This documentation should be maintained for the life of the facility (§61.356(i)(3)).

- Descriptions of any process parameters that are continuously monitored to ensure the control device is operating in compliance with Subpart FF. The descriptions should include the control device's specifications, and reasons why the parameter(s) was/were selected. This documentation should be maintained for the life of the facility (§61.356(j)(2)).

- Periods and durations when the closed-vent system and control device are not operated as designed (§61.356(j)(3)).

- Date and time when the carbon canisters are monitored (if applicable), when breakthrough is measured (if applicable), and when the canister is replaced (§61.356(j)(10)).

### 3.10 Reporting Requirements (40 CFR §§61. 13(f) and 61.357)

The following reports shall be submitted to EPA Region IX:

- Performance test reports. These reports shall be submitted within 31 days following testing and should include the information required in 40 CFR §61.356(e)(3) or §61.356(f)(3), as applicable (§61.13(f)).

- Initial Subpart FF report. This report should have been submitted by April 7, 1993 for existing facilities, and be submitted at start-up for facilities constructed after January 7, 1993. The contents of the report are outlined in 40 CFR §61.357(a)(1) - (3).

Annual Subpart FF TAB report (Appendix D).2 As outlined in the rules, if the total amount of benzene waste included in the Facility TAB is equal to or greater than 1.0 Mg/yr (1.1 ton/yr), but less than 10 Mg/yr (11 ton/yr), the operator shall submit a report by April 7 each year updating the TAB, identifying the controlled/uncontrolled and organic/aqueous designations of each waste stream, along with other data described in 40 CFR §61.357(a)(1)-(3) (§61.357(c)).[3] If the Facility's TAB is 10 Mg/yr or greater, additional reporting is required pursuant to 40 CFR §61.357(d), including certification of equipment installation and quarterly reporting. The Facility may be deemed to know its TAB calculation throughout the year as wastes are received, and it is therefore essential that the Facility track this information continuously so that it can respond immediately before its TAB ever equals or exceeds 10 Mg/yr.

## 4.0 EVOQUA WATER TECHNOLOGIES, PARKER, ARIZONA FACILITY COMPLIANCE PLAN

### 4.1 NESHAP Subpart FF Applicability to the Parker, Arizona Facility

NESHAP Subparts A and FF apply to the spent carbon storage and treatment processes within the facility. All affected process units and storage tanks are equipped with controls to benzene emissions to the atmosphere.

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2 If the facility TAB is less than 1 Mg/yr, then no TAB report is required unless there is a change that could cause the TAB to increase to 1 Mg/yr or more.

3 Chemical plants, coke by-product recovery plants and refineries with a TAB equal to or greater than 1 Mg and less than 10 Mg/yr are usually not subject to BWON control requirements. 40 C.F.R. §61.342(a). Thus, the purpose of the annual report for these facilities is typically to confirm that the TAB remains below 10 Mg. However, TSD facilities that treat BWON-regulated wastes received from off-site facilities must provide the same degree of control as the generating facility would so they may be subject to BWON control even if their TAB is less than 10 Mg/yr.

The specific process components subject to Subpart FF compliance are as follows:

| I.D. NO. | DESCRIPTION | APPLICABLE STANDARD | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite | §61.345 | Subpart FF wastes are stored in drums, vessels, and supersacks. |
| N/A | Containers/Bins Storing Wastes Generated Onsite that May Contain FF Wastes | §61.345<br>§61.342(f) | Benzene wastes shipped offsite must meet the container reqts. and offsite shipment reqts. |
| H-1<br>H-2 | Spent Carbon Unloading Hoppers Nos. 1 and 2 and associated transfer lines | §61.346(b) | These hoppers are individual drain systems, which are equipped with covers; the hoppers are controlled by a baghouse and carbon adsorption (WS-2), which are not regulated under Subpart FF (see footnote 1 above). |
| T-1 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-2 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-5 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-6 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-9 | Recycle Water Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-18 | Furnace Feed Tank | §61.343 | Tank vapors controlled by carbon adsorption<br>(WS-3) |
| RF-2 | Reactivation Furnace No.2 | §61.348 | Regenerated carbon must meet product specifications |
| AB-2 | Afterburner No. 2 | §61.349(a)(2)(i)(c) | Minimum residence time of 0.5 seconds at a minimum temperature of 1400 F |
| C-5 | Dewater Screw | §61.346(a) | Emissions routed to the afterburner (AB-2) |
| C-16 | Weight belt | §61.346(a) | Emissions routed to the afterburner (AB-2) |
| WS-1 | Carbon Adsorber No. 1 | §61.349 | Carbon Canister replaced prior to design breakthrough |
| WS-3 | Carbon Adsorber No. 3 | §61.349 | Carbon Canister replaced prior to design breakthrough |

The Parker, Arizona facility is required to regenerate spent carbon to a useful product. Compliance with 40 CFR §61.348 also requires that the upstream tanks, containers, individual drain systems and control devices noted in the table above, along with any associated piping or closed-vent system, must meet the applicable requirements of Subpart FF (i.e., §61.343, §61.345, §61.346 and §61.349).

The debris bin and associated drums that are used to store FF wastes from the facility, must not only meet the container requirements of 40 CFR §61.345, but also the requirements of 40 CFR §342(f). Section 342(f) requires that a notice accompany each waste shipment indicating that the wastes must be treated in accordance with the standards of Subpart FF. Records must be maintained indicating the date the waste is shipped offsite, quantity of waste shipped offsite, the name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment (§61.356(c)).

Hoppers H-1 and H-2 are used to convey Subpart FF wastes from containers and other waste management units to the regeneration system. As such, these units are considered individual drain systems, which meet Subpart FF requirements under 61.346(b). Each of the units is equipped with a cover, which is kept closed when the hoppers are not being used to convey Subpart FF wastes. The associated lines that convey Subpart FF wastes from H-1 and H-2 to the Spent Carbon Storage Tanks (T-1, T-2, T-5 and T-6) are hard piping and are inspected quarterly for any evidence of leaks (open valves, indications of low liquid levels, rips, tears, or cracks in equipment, etc.). Any repairs that are identified as required during these quarterly inspections are performed within 15 days, as required (See Section 4.4, below).

The process wastewater stream associated with the wet scrubber control system has been specifically excluded from NESHAP applicability since it does not come in contact with Subpart FF waste streams. Additionally, water that comes in contact with Subpart FF waste is also exempt from Subpart FF treatment requirements under 40 CFR §61.342(c) as long as it contains less than 10 ppmw total benzene on an annual weighted average basis. The facility drain system is also exempt from Subpart FF compliance since it does not handle Subpart FF waste. Subpart FF wastes, which are contained in closed drums and roll-offs are managed so that none of these materials is allowed to enter the maintenance drains within the facility during surface cleaning operations.

## 4.2 Compliance Responsibilities

The Plant Manager has the primary responsibility for overseeing the NESHAP Subpart FF compliance program for the Parker, Arizona facility. More specifically, the Plant Manager assures that all permitting, notifications, monitoring, inspections, recordkeeping, and reporting are performed in accordance with the applicable regulations. The Plant Manager is responsible for assuring that all needed repairs and other maintenance activities are performed as required. The Plant Operator is responsible for monitoring the day-to-day operation of the facility.

## 4.3 Permitting and Notifications

All proposed changes to the Parker, Arizona facility are reviewed by the Plant Manager or his designee to determine if the modification provisions of the NESHAP regulations have been triggered. In making this determination, the Environmental Plant Manager or his/her designee will determine whether or not the changes can potentially increase benzene emissions. If the changes will not increase benzene emissions, then the NESHAP modification provisions are not triggered. If the changes have the potential to increase facility benzene emissions, then the Environmental Health and Safety Manager or his/her designee will determine if the capital expenditure threshold will be exceeded by the project. As noted in Section 3.2, a capital expenditure is incurred for NESHAP applicability when the cost of the changes exceeds seven percent of the original facility cost.

If the changes are deemed as "modifications", the Environmental Health and Safety Manager or his/her designee will prepare a permit application that conforms to the requirement of Section 3.3 and submit it to EPA Region IX. No facility changes will be made until EPA approves the application.

The Environmental Health and Safety Manager or his/her designee is responsible for making all notifications required by NESHAP Subpart A and Subpart FF. The contents of these notifications are outlined in Section 3.4. Copies of relevant notifications are maintained in Appendix B of this plan.

### 4.4 Inspection and Repair

The Environmental Health and Safety Manager or his/her designee performs all routine quarterly visual inspections of the facility. During these inspections, the Environmental Health and Safety Manager or his/her designee examines the stationary equipment listed in Section 4.1 and its interconnecting piping for cracks, gaps, or other problems. In addition, the Environmental Health and Safety Manager or his/her designee visually inspects all spent carbon containers maintained onsite for more than one quarter year. Each visual inspection is documented on the Visual Inspection Form and copies of completed forms are maintained in the Facility files.

The Environmental Health and Safety Manager or his/her designee performs the Method 21 inspections annually during periods when the facility is processing Subpart FF waste. During these inspections, the Environmental Health and Safety Manager or his/her designee inspects all potential leak sources listed on the Annual Method 21 Inspection Form. The Environmental Health and Safety Manager or his/her designee documents the results of the inspection on the Annual Method 21 Inspection Form and maintains copies of the completed forms in the Facility files. Spent carbon containers maintained onsite for more than one year must be included in this inspection.

The initial inspections of Subpart FF waste containers delivered to the Parker, Arizona facility are completed by the respective generator of the waste. This inspection includes both a visual inspection of the container and a Method 21 inspection of all potential leak interfaces. As noted above, containers maintained for more than one quarter year at the facility, will be visually inspected by the Environmental Health and Safety Manager or his/her designee during the routine quarterly visual inspection. Furthermore, containers maintained onsite for more than one year must be inspected using Method 21.

The debris bin and baghouse drum shall be visually inspected and inspected using Method 21 by the Environmental Health and Safety Manager or his designee following initial loading with Subpart FF containing wastes. In addition, the debris bin and containers will be visually re-inspected if it is onsite for more than 90 days (with the exception of the debris bin which cannot be stored longer than 90 days). These inspections shall be documented in the Debris Bin and Associated Drums Inspection Log found in the Facility files.

All leaks (defined as an instrument reading exceeding 500 ppmv over background), openings, cracks or other problems identified during the visual and Method 21 inspections will be repaired within the time frames established in Table 1 (see Section 3.6, above). The Environmental Health and Safety Manager or his/her designee who detects the leak will work with the Plant Manager or his/her designee to complete the repair. Completed repairs will be documented on the affected inspection forms maintained in the Facility files.

If a repair cannot be completed within the specified time without a partial or complete facility shutdown, the Environmental Health and Safety Manager or his/her designee will document in the affected inspection form the reason why the repair is delayed. The Environmental Health and Safety Manager or his/her designee will ensure that all repairs are completed during the next process unit shutdown, and document in the affected inspection form the completion of the repair.

## 4.5 Monitoring

Compliance with the general treatment requirements are monitored as follows:

| EQUIPMENT COMPONENT / MATERIAL | APPLICABLE STANDARD | MONITORING METHOD | FREQUENCY |
|---|---|---|---|
| Afterburner (AB-2) | §61.349(a)(2)(i)(c) | Temperature | Continuous |
| Wastewater in Contact with Spent Carbon Discharged to POTW | §61.342(c)(2) | Benzene concentration (minimum of three (3) samples) determined by methods prescribed by §61.355(c)(2) | Annual |
| Carbon Adsorber (WS-1) | §61.349(a)(2)(ii) | Calculations in Appendix C show that the canister must be replaced at least every 7.88 days. | 7.88 days at a maximum or more frequently |
| Carbon Adsorber (WS-3) | §61.349(a)(2)(ii) | Calculations in Appendix C show that the canister must be replaced at least every 38 days. | 38 days at a maximum or more frequently |

The Plant Operator reviews all temperature readings on a daily basis to assure that the reactivation furnace is operating as designed, and the afterburner is maintained at a temperature greater than 760°C (1400°F) when spent carbon is in the unit. If the temperature data for the afterburner indicate a performance problem, the Plant Operator will correct the problem as soon as possible. The reasons justifying the use of temperature as the main monitoring parameter are provided in Appendix D.

To comply with the requirements of 40 CFR §61.356(b), the Environmental Health and Safety Manager or his/her designee shall verify on an annual basis the annual flow rate and the benzene concentration in the untreated wastewater in contact with spent carbon (minimum of 3 samples). Determinations shall assure that the benzene concentration in the wastewater is less than 10 ppmw and records will be maintained in the Facility files.

The Plant Manager or his/her designee will replace the carbon in adsorbers WS-1 and WS-3 in accordance with the schedule identified above. Immediately following adsorber replacement, the Plant Manager or his designee will document the change-out in the Carbon Canister Replacement Log maintained in the Facility files.

Any periods of malfunction, equipment start-up and shutdown will be logged by the Plant Operator in the Process Monitoring log. These logs are maintained in the file room.

### 4.6 Performance Testing

No emissions testing has been performed to demonstrate compliance with the applicable standards of Subpart FF. All compliance determinations have been performed through engineering calculations. Calculations documenting the performance of the carbon adsorbers are included in Appendix C.

### 4.7 Recordkeeping

The following table identifies all applicable Subpart A and FF records required to be maintained at the Parker, Arizona facility, the individual responsible for its maintenance, and the location where the records are stored. Unless otherwise noted in the table, the records will be maintained for a minimum of two years, as required by NESHAP regulations.

NESHAP FF RECORDKEEPING PLAN
EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

| Record Description | Individual Responsible | Comments/Location |
|---|---|---|
| Notifications (§§61.09, 61.10, 61.13(c), and 61.342(f)) – Note: the initial notification should be retained for the life of the facility | Plant Manager | Appendix B of the Compliance Plan (see Section 3.4) |
| List of streams subject to Subpart FF | Plant Manager | Section 4.1 of the Compliance Plan |
| Total annual benzene reports | Plant Manager | Facility files and Appendix E |
| Date the debris bin and associated drums shipped offsite, quantity of waste shipped offsite, name and address of facility receiving waste (§61.356(c)) | Plant Manager | Waste manifests in Plant Manager's office |
| Engineering design documentation of control equipment (§61.356(d))* | Plant Manager | Plant Manager's office |
| Engineering calculations demonstrating Control Equipment performance (§61.356(f)(2)(i)(G))* | Plant Manager | Appendix C of Compliance Plan |

NESHAP FF RECORDKEEPING PLAN
EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

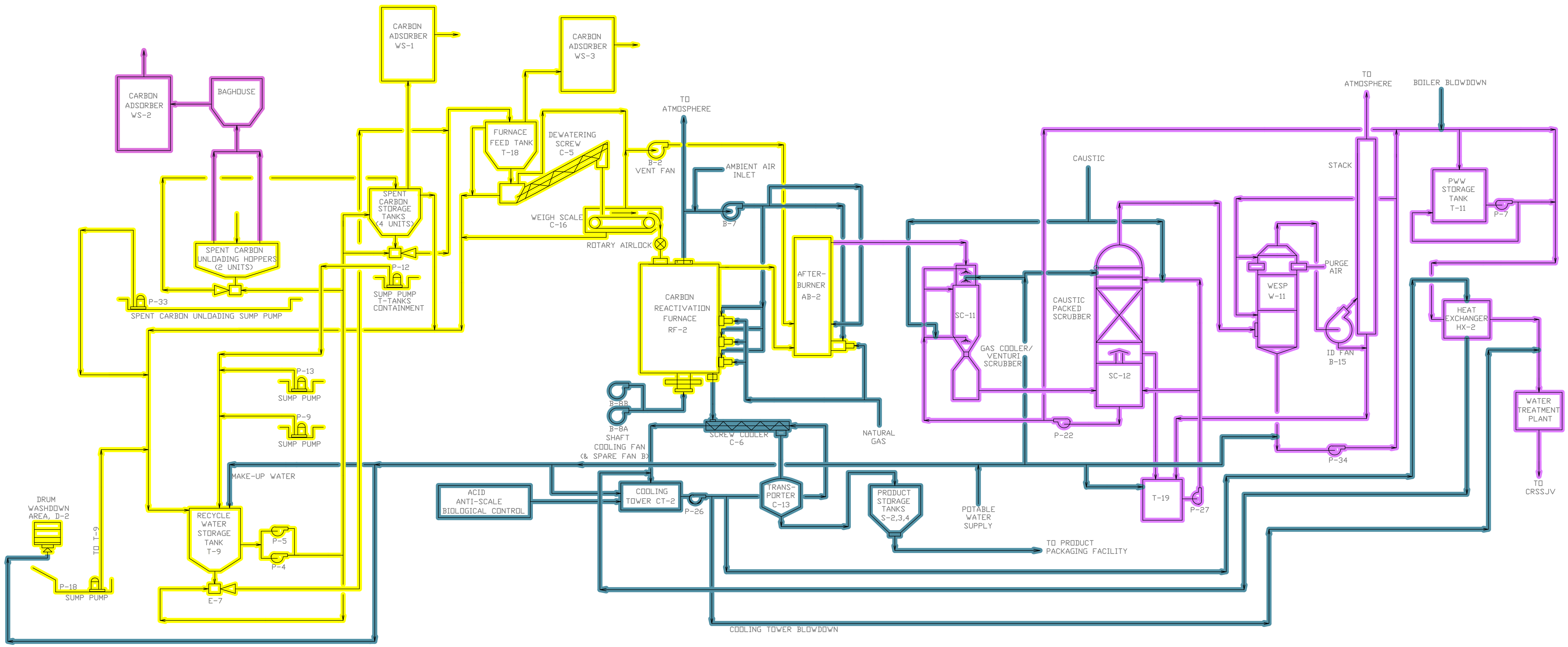
| Record Description | Individual Responsible | Comments/Location |
|---|---|---|
| Test results demonstrating control equipment performance (§61.356(f)(3))* | N/A | Not Applicable. Calculations have been used in lieu of testing results. |
| Visual inspection records (§61.356(g)) | Plant Manager | Facility files and Appendix E |
| Method 21 inspection records (§61.356(h)) | Plant Manager | Facility files and Appendix E |
| Dates of start-up, shutdown, and malfunction of treatment unit (§61.356(i)(1) & (5)) | Plant Operator | Process Monitoring Log maintained in Plant Manager's office |
| Testing results from all monthly sampling (§61.356(i)(3)) | N/A | Not Applicable. No monthly sampling of regenerated carbon required since regenerated carbon is a product |
| Descriptions of process parameters monitored to ensure treatment unit performance (§61.356(i)(3))* | Plant Manager | Appendix D of the Compliance Plan |
| Dates of startup, shutdown, and malfunction of the carbon absorbers (§61.356(j)(1) & (3)) | Plant Operator | Process Monitoring Log maintained in Plant Manager's office |
| Descriptions of process parameters monitored to ensure control device performance (§61.356(j)(2))* | N/A | Not Applicable. The Carbon Absorbers (WS-1 and WS-3) are changed-out on a predetermined frequency; no monitoring is performed. See Appendix C of the Compliance Plan. |
| Date and time when the carbon absorbers are monitored and replaced (§61.356(j)(10)) | Plant Manager | Facility files and Appendix E |

Records noted with an asterisk (*) must be maintained for the life of the facility. Otherwise, facility is to maintain records for two years (§61.356(a)).

## 4.8 Reporting

The Environmental Health and Safety Manager or his/her designee shall prepare the Annual Subpart FF Report and submit it to EPA to EPA Region IX by April 7th of each year whenever the facility TAB is 1 Mg/yr or greater. This report will cover the previous calendar year's activities and meet the requirements of 40 CFR 61.357(a)(1)-(3). Copies of the report will be maintained in the Facility files.

Appendix A
Process Flow Diagram




SUBJECT TO NESHAP SUBPART FF

EXEMPT FROM SUBPARTS BB, CC, AND FF (SEE COMPLIANCE PLANS FOR BASES)

NOT SUBJECT TO SUBPARTS BB & CC (DOES NOT COME IN CONTACT WITH HAZARDOUS WASTE)

| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 0 | KAC | ATH | | UPDATED FROM PC-1466 PR-003 | 3-5-19 |

CBE CHAVOND-BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

PROCESS FLOW DIAGRAM
SUBPARTS BB, CC, AND FF APPLICABILITY

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 1/10/01 | KEM | 1/18/07 | | |

| SCALE | DWG. NO. | REV. |
|---|---|---|
| NONE | FIGURE 1 | 0 |

PRINT DATE: 3/7/19

Appendix B
Copies of Notifications

Westates Carbon-A.. ..zona, Inc.

2523 Mutahar Street
Post Office Box E
Parker, AZ 85344
Tel. 602-669-5758
Fax. 602-669-5775/5776

**BY HAND DELIVERY**

June 6, 1995

Mr. David Howecamp
Director, Air and Toxics Division (A-1)
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

FILE COPY

**RE: Westates Carbon-Arizona, Inc. (WCAI)**
**Notifications Pursuant to Benzene NESHAP**

Dear Mr. Howecamp:

Please find enclosed one copy of the following documents with respect to the WCAI facility in Parker, Arizona:

1) Existing Source Notification as required by 40 CFR §61.10;

2) Supplement to regulatory status notification as required by 40 CFR §61.357(a); and

3) Subpart FF annual reports for calendar years 1993 and 1994.

Representatives of WCAI discussed the applicability of Subpart FF with Mr. Eric Auer of EPA Region IX by telephone on May 25, 1995, and requested a meeting to discuss related issues.

A meeting has been scheduled at Region IX on the date of this letter and is expected to include representatives of WCAI and Mr. Auer and Ms. Jennifer Fox of EPA Region IX.

As discussed previously with Mr. Auer, WCAI conducted an extensive internal compliance audit earlier this year and determined that Subpart FF requirements were applicable at its facility to an extent not previously understood. WCAI immediately located and hired a consultant with experience in Subpart FF compliance who prepared a program to ensure our facility would fully comply with all Subpart FF requirements. The enclosed documents are a direct result of these activities and ensure that WCAI achieves full compliance with Subpart FF.

We anticipate a discussion of these documents with Mr. Auer and Ms. Fox today and remain ready to work with Region IX to ensure continuous compliance with this complex set of regulations.

Sincerely,

Monte McCue
Plant Manager

# EXISTING SOURCE NOTIFICATION REQUIRED BY 40 CFR 61.10
# WESTATES CARBON - ARIZONA, INC.

The following information is provided as required by 40 CFR 61.10:

**1. Name and Address of the Owner or Operator [§61.10(a)(1)]:**

Westates Carbon - Arizona, Inc.
P.O. Box E
2523 Mutahar Street
Parker, Arizona 85344

Contact: Mr. Monte McCue, Plant Manager
Phone: (520) 669 - 5758
FAX: (520) 669 - 5775



**2. The Location of the Source [§61.10(a)(2)]:**

The facility is located in La Paz County, Arizona near the city of Parker. The facility is located within the Colorado River Indian Tribes (CRIT) reservation lands. EPA retains jurisdiction over this facility as its authority has not been delegated to tribal authorities [See 40 CFR 52.120 et seq.].

**3. Type of Hazardous Air Pollutants Emitted [§61.10(a)(3)]:**

This facility potentially emits benzene, a substance which is regulated under Subpart FF - National Emission Standard for Benzene Waste Operations (§61.340 et seq.). Additional hazardous air pollutants potentially emitted from the facility in trace amounts include, but are not limited to the following:

| | |
|---|---|
| Aniline | Benzo(a)Anthracene |
| Benzo(b)Fluoranthene | Carbon Tetrachloride |
| Chlorobenzene | Chloroform |
| Cresol | Dibenzofuran |
| Dioxane (1,4 -) | Ethylbenzene |
| Hexane | Hexane (1 -) |
| Methyl Ethyl Ketone | Methyl Isobutyl Ketone |
| Methyltertiarybutyl Ether | Naphthalene |
| Pentachlorophenol | Phenol |
| Propylbenzene | Tetrahydrofuran |
| Toluene | Triethylamine |
| Xylene | Arsenic |
| Cadmium | Chromium |
| Beryllium | Lead |
| Mercury | Nickel |
| Selenium | Antimony |

The above list is a conservative representation of potential hazardous air pollutants emitted from the facility because it has been based on analyses of Subpart FF waste received, and not upon emission testing results. The remaining sections of this notice will discuss the control of benzene emissions as it is the only hazardous air pollutant regulated by Subpart FF.

**4. Brief Description of the Operation [§61.10(a)(4)]:**

The Westates Carbon-Arizona, Inc. (WCAI) Parker, Arizona facility is an existing carbon reactivation facility. Activated carbon is used in pollution control equipment to remove organic compounds and other materials from liquid and vapor phase process and waste streams. Once the carbon is "spent" (i.e., utilized to its adsorptive capacity), it must either be disposed of or reactivated at a facility such as WCAI's Parker, Arizona facility. Some of the spent carbon processed at the Parker facility is received from facilities subject to Subpart FF.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-1) and an afterburner (AB-1). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve a destruction and removal efficiency greater than 99%. Reactivated carbon is produced from the treatment unit such that the reactivated carbon contains less than 10 ppmw benzene.

The facility currently operates as an interim status facility under the Resource Conservation and Recovery Act (RCRA) and is limited to a maximum production capacity of 1200 lb/hr of reactivated carbon. However, the existing reactivation treatment unit has a nominal production capacity of 600 lb/hr of reactivated carbon.

Sources of potential benzene emissions from Subpart FF waste include:

- Carbon adsorbers (WS-1 and WS-2), which control spent carbon storage and furnace feed tank volatile organic compound (VOC) emissions, including benzene.
- Emissions associated with the reactivation treatment unit (RF-1 and AB-1).
- Fugitive emissions from the unloading of spent carbon into hoppers H-1 and H-2.

**5. The Average Weight Per Month of Hazardous Materials Processed [§61.10(a)(5)]:**

The facility commenced operation in August 1992 and processed 90.24 pounds of benzene prior to May 1, 1993. The average weight per month of benzene processed was approximately 10 pounds. This monthly amount of benzene processed has been averaged over the nine month period from August 1992 though April 1993.

**6. Description of Existing Control Equipment [§61.10(a)(6)]:**

<u>WS-1 and WS-2</u>

Carbon adsorbers WS-1 and WS-2 remove VOCs from the spent carbon storage and furnace feed tanks. WS-1 is a carbon canister that contains approximately 1,000 pounds of activated carbon. WS-2 contains 4,500 pounds of activated carbon. These devices are designed to control organic emissions by at least 95%, or benzene by at least 98%.

<u>H-1 and H-2</u>

No specific Subpart FF emissions standards apply to the unloading hoppers (H-1 and H-2). However, in an effort to minimize fugitive dust emissions that potentially contain benzene, WCAI has implemented water spray controls during the unloading operation.

**EXISTING SOURCE NOTIFICATION REQUIRED BY 40 CFR 61.10**
**WESTATES CARBON - ARIZONA, INC.**
**(CONT.)**

7. **Statement of Compliance [§61.10(a)(7)]:**

The emissions from the WCAI Parker, Arizona facility can meet the emission limitations contained in the National Emission Standards as of the date of this notification.

Mr. Monte McCue
Manager

6-6-95

Date

# Appendix C
# Engineering Calculations Supporting Control Device -Performance

# Engineering Calculations Supporting Control Device Performance

The Evoqua Water Technologies (EWT) Parker, Arizona facility operates two carbon adsorbers (WS-1 and WS-3), which will treat the vapors from the spent carbon storage tanks, recycle water tank and furnace feed tank. WS-1 treats vapors from spent carbon storage tanks T-1, T-2, T-5, T-6 and T-9.

| **DESIGN PARAMETER** | **WS-1** (T-1,2,5,6,9) | **WS-3** (T-18) |
|---|---|---|
| Maximum Flow Rate (cfm) | 115 | 5.9 |
| Inlet Benzene Concentration (ppmv) | 4,540 | 4,540 |
| Relative Humidity (%) | 50% | 50% |
| Temperature | Ambient | Ambient |
| Type of Carbon | Granulated Activated Carbon | Granulated Activated Carbon |
| Capacity of Carbon Canister (lbs.) | 4000 | 1000 |
| Working Capacity of Activated Carbon | 30% | 30% |
| Source Operating Schedule | Continuous | Continuous |
| Theoretical Design Control Efficiency (%) | 100 | 100 |
| Design Carbon Replacement Period (Days) | 7.88 | 38 |
| Theoretical Outlet Benzene Concentration (ppmv) | 0 | 0 |

Calculations and technical data to support the above design parameters are provided below:

## <u>Flow Rate</u>

The flow rates to WS-1 and WS-3 are based on the actual observed maximum flow rates. The maximum daily flow rates used in the calculations below more accurately reflect maximum conditions anticipated during the life of each carbon bed.

**Inlet Benzene Concentration**

The inlet vent stream composition consists of air, water vapor, and entrained hydrocarbon from the spent carbon received at the facility. In preparing this analysis, it is assumed that the total hydrocarbon concentration of the spent carbon can be as high as 30%, and that the maximum benzene concentration can be as high as 15%.

The inlet benzene concentration for WS-1 is calculated assuming that all of the benzene absorbed by the water in contact with spent carbon is liberated in the spent carbon storage tanks. Using the attached isotherm, a 15% benzene concentration in the waste would correspond to a 30 ppmw (mg/l) concentration of benzene in the water. The inlet benzene concentration is determined for WS-1 as follows:

- Determine the amount of benzene being liberated from the water in the spent carbon storage tanks.

  $\mathbf{B_{WS1}}$ = $(FR)(C)(WF)(28.32\ L/ft^3)(2.2 \times 10^{-6}\ lb/mg)\ (60\ min/hr)$

  where:

  $\mathbf{B_{WS1}}$ = Amount of Benzene Directed to WS-1 (lb/hr)
  **FR** = Amount of Slurry Being Added to the Tanks or Vapor Directed to WS-1 (cfm)
  **C** = Concentration of Benzene in the Water (30 mg/L)
  **WF** = Fraction of Water by Volume in the Slurry(0.50)

  $\mathbf{B_{WS1}}$ = $(115\ cfm)(30\ mg/L)(0.5)(28.32\ L/ft^3)(2.2 \times 10^{-6}\ lb/mg)(60\ min/hr)$

  $\mathbf{B_{WS1}}$ = 6.448 lb/hr

- Determine the concentration of benzene (ppmv) being liberated to WS-1.

  $$\mathbf{CONC} = \frac{[(B_{WS1}) / (MW_B)](1{,}000{,}000)}{[(FR)(60\ min/hr)] / (MVOL)}$$

  where:

  **CONC** = The Inlet Benzene Concentration to WS-1 (ppmv)
  $\mathbf{B_{WS1}}$ = Amount of Benzene Directed to WS-1 (lb/hr)
  $\mathbf{MW_B}$ = Molecular Weight of Benzene (78.12 lb/lb-mol)
  **FR** = Vapor Flow Rate to WS-1 (cfm)

**MVOL** = Molar Volume of Gas (379 $ft^3$/lb-mol)

$$\textbf{CONC} = \frac{[(6.448\ \text{lb/hr}) / (78.12\ \text{lb/lb-mol})](1{,}000{,}000)]}{[(115\ \text{cfm})(60\ \text{min/hr})] / (379\ \text{ft}^3\text{/lb-mol})]}$$

**CONC** = 4,534 ppmv

For calculation purposes, the concentration of benzene is assumed the same at WS-1 and WS-3.

**Working Capacity of the Activated Carbon**

The working capacity of the carbon is determined using the attached isotherm. This isotherm indicates that the working capacity of WS-1 and WS-3 is approximately 30% for benzene.

**Design Replacement Period**

The design replacement period is calculated using the following equation:

$$\mathbf{Y} = \frac{(ACgac / 100)\ (Wgac)}{[(Ci - Co) / 10^6](Qf)(D)(1440\ \text{min/day})]}$$

where:

**Y** = Carbon Bed Life (days)
**ACgac** = Adsorption Capacity of Carbon for Benzene (wt. %)
**Wgac** = Mass of Carbon Bed (lb)
**Ci** = Inlet Concentration Benzene (ppmv)
**Co** = Outlet Concentration Benzene (0 ppmv)
**Qf** = Gas Flow Rate Through Adsorber (cfm)
**D** = Density of Benzene (0.2028 lb/$ft^3$)

- Calculate the design carbon replacement period for **WS-1** using the above equation.

$$\mathbf{Y} = \frac{(30 / 100)(4000\ \text{lb})}{((4540 - 0) / 10^6)(115\ \text{cfm})(0.2028\ \text{lb/ft}^3)(1440\ \text{min/day}))}$$

**Y** = **7.88 days**

- Calculate the design carbon replacement period for **WS-3** using the above equation.

$$\mathbf{Y} = \frac{(30 / 100)(1000 \text{ lb})}{((4534 - 0) / 10^6)(5.9 \text{ cfm})(0.2028 \text{ lb/ft}^3)(1440 \text{ min/day}))}$$

$\mathbf{Y}$ = **38 days**

Appendix D
Description of Process Parameters Monitored

**Description of Process Parameters Monitored**
**Evoqua Water Technologies – Parker, Arizona**

| PROCESS PARAMETER MONITORED | REASON FOR SELECTING PARAMETER |
|---|---|
| Temperature Indicators on Afterburner (AB-2) | Temperature is the best parameter for detecting proper afterburner combustion and performance, and assuring compliance with Subpart FF. |
| Temperature Indicators on hearths 3-5 on Reactivation Furnace (RF-2) | Temperature is the best parameter for detecting proper reactivation furnace combustion and performance, and assuring compliance with Subpart FF. |

**THE TREATMENT UNIT DESIGN SPECIFICATIONS ARE MAINTAINED IN THE ADMINISTRATION OFFICE**

Appendix E

Subpart FF Compliance Records and Other Information

(Representative Documents Only. Current Records Maintained in Facility Files)

- Annual Reports
- Quarterly Visual Inspection Records
- Annual Method 21 Inspection Records
- Debris Bin and Associated Drum Inspection Records
- Carbon Canister Replacement Logs
- Engineering Calculations Supporting Treatment Unit Performance

EVOQUA WATER TECHNOLOGIES

Parker Facility

January 2018 - December 2018

# Benzene NESHAP Report

| Gen Name: | Profile | Gen EPA ID | FF | Arrival Date | Manifest Do | Qty | Container | PPM | Pounds |
|---|---|---|---|---|---|---|---|---|---|
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 3/13/2018 | 008186994 J | 2 | VSC 1200 | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 6/19/2018 | 017924946 J | 4 | VSC 1200 | 815 | 3.26 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 7/17/2018 | 017924982 J | 2 | VSC 1200 | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 10/2/2018 | 017924980 J | 1 | SC 2000 (Nev | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 12/27/2018 | 017924981 J | 1 | SC 2000 (Nev | 815 | 1.63 |
| | | | | | | Profile Total Pounds | | | **9.78** |
| [redacted] | W180072RH | CAD009114919 | ☑ | 10/23/2018 | 013678870 J | 4 | Drum | 1430 | 1.24696 |
| | | | | | | Profile Total Pounds | | | **1.24696** |
| [redacted] | W170020RH | LAD000755793 | ☑ | 8/21/2018 | 017289322 J | 2 | PV1000 | 0.897 | 0.003588 |
| | | | | | | Profile Total Pounds | | | **0.003588** |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 1/23/2018 | 008186982 J | 8 | Drum | 0.4515 | 0.00078742 |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 5/29/2018 | 018508514 J | 8 | Drum | 0.4515 | 0.00078742 |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 12/18/2018 | 018508877 J | 8 | Drum | 0.4515 | 0.00078742 |
| | | | | | | Profile Total Pounds | | | **0.00236225** |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 3/9/2018 | 016186328 J | 5 | VSC 1200 | 0.01 | 0.00005 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/1/2018 | 016186329 | 4 | VSC 1200 | 0.01 | 0.00004 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/1/2018 | 016186330 J | 5 | VSC 1200 | 0.01 | 0.00005 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/28/2018 | 016186331 J | 3 | VSC 1200 | 0.01 | 0.00003 |
| | | | | | | Profile Total Pounds | | | **0.00017** |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/8/2018 | 016186332 J | 5 | VSC 1200 | 731 | 3.655 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/8/2018 | 016186332 J | 4 | Drum | 731 | 0.637432 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/29/2018 | 018026292 J | 2 | VSC 1200 | 731 | 1.462 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/29/2018 | 018026292 J | 3 | Drum | 731 | 0.478074 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 12/3/2018 | 018026293 J | 4 | VSC 1200 | 731 | 2.924 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 12/3/2018 | 018026293 J | 1 | Drum | 731 | 0.159358 |
| | | | | | | Profile Total Pounds | | | **9.315864** |
| [redacted] | W180094RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 2 | PV1000 | 560 | 2.24 |
| [redacted] | W180094RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 2 | PV2000 | 560 | 4.48 |
| | | | | | | Profile Total Pounds | | | **6.72** |

| Gen Name: | Profile | Gen EPA ID | FF | Arrival Date | Manifest Do | Qty | Container | PPM | Pounds |
|---|---|---|---|---|---|---|---|---|---|
| [redacted] | W170002RH | LAD020877361 | ☑ | 3/2/2018 | 007672687 F | 12 | Drum | 3100 | 8.1096 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 6/14/2018 | 007672689 F | 2 | Bag | 3100 | 8.06 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 1 | Bag | 3100 | 4.03 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 10/26/2018 | 007672691 F | 2 | Bag | 3100 | 8.06 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 11/16/2018 | 007672692 F | 2 | Drum | 3100 | 1.3516 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 11/16/2018 | 007672692 F | 4 | VSC 1200 | 3100 | 12.4 |
| | | | | | | **Profile Total Pounds** | | | **42.0112** |
| [redacted] | W170117RH | CA0001576081 | ☑ | 3/2/2018 | 004491797 J | 4 | Bag | 190 | 0.988 |
| [redacted] | W170117RH | CA0001576081 | ☑ | 3/2/2018 | 004491798 J | 10 | Bag | 190 | 2.47 |
| | | | | | | **Profile Total Pounds** | | | **3.458** |
| [redacted] | W170036RH | LA0000145797 | ☑ | 8/21/2018 | 007581250 J | 4 | Bag | 17.4 | 0.09048 |
| | | | | | | **Profile Total Pounds** | | | **0.09048** |
| | | | | | | **Report Total Pounds** | | | **72.62862425** |

# Debris Bin Testing Summary

| Date Shipped | Manifest Number | Weight | Bin Number | Accumulation Days | First Addition | Background Reading | Highest Reading Around Lid | Last Load Sealed | Background Reading | Highest Reading Around Lid |
|---|---|---|---|---|---|---|---|---|---|---|
| 8/9/2016 | 009918524 FLE | 37,920 | **CHHT 40226** | **88** | **5/13/2016** | **<5** | **<5** | **8/8/2016** | **<5** | **<5** |
| 9/30/2016 | 008812441 FLE | 19,750 | **CHHP20366** | **37** | **8/24/2016** | **<5** | **<5** | **9/12/2016** | **<5** | **<5** |
| 12/5/2016 | 010293492 FLE | 31,540 | **CHHP40217** | **84** | **9/12/2016** | **<5** | **<5** | **12/6/2016** | **<5** | **<5** |
| 3/2/2017 | 010508884 FLE | 23,530 | **CHHP20365** | **82** | **12/10/2016** | **<5** | **<5** | **2/27/2017** | **<5** | **<5** |
| 5/3/2017 | 010559476 FLE | 15,650 | **CHHP21061** | **58** | **3/6/2017** | **<5** | **<5** | **4/28/2017** | **<5** | **<5** |
| 8/17/2017 | 011013823 FLE | 15,250 | **251328** | **89** | **5/20/2017** | **<5** | **<5** | **8/16/2017** | **<5** | **<5** |
| 10/11/2017 | 011012274 FLE | 21,300 | **251351** | **51** | **8/21/2017** | **<5** | **<5** | **10/10/2017** | **<5** | **<5** |
| 1/10/2018 | 011248349 FLE | 11,310 | **CHHP20905** | **86** | **10/16/2017** | **<5** | **<5** | **1/10/2018** | **<5** | **<5** |
| 4/4/2018 | 011704651 FLE | 22,870 | **251027** | **80** | **1/14/2018** | **<5** | **<5** | **4/10/2018** | **<5** | **<5** |
| 6/27/2018 | 011211176 FLE | 16,130 | **CHHP20417** | **78** | **4/10/2018** | **<5** | **<5** | **6/27/2018** | **<5** | **<5** |
| 9/25/2018 | 012325495 FLE | 19,110 | **CHHP20985** | **85** | **7/2/2018** | **<5** | **<5** | **9/24/2018** | **<5** | **<5** |
| 12/27/2018 | 012324667 FLE | 22,520 | **251488** | **83** | **10/5/2018** | **<5** | **<5** | **12/27/2018** | **<5** | **<5** |
| 3/26/2019 | 012831360 FLE | 23,170 | **CHHP21119** | **81** | **1/4/2019** | **<5** | **<5** | **3/26/2019** | **<5** | **<5** |
| 5/13/2019 | 013487828 FLE | 12,730 | **CHHP21069** | **67** | **3/7/2019** | **<5** | **<5** | **5/13/2019** | **<5** | **<5** |
| 7/17/2019 | 013587416 FLE | | | **58** | **5/20/2019** | **<5** | **<5** | **7/16/2019** | **<5** | **<5** |
| | | | | | | | | | | |
| | | | | | | | | | | |

CALCULATION OF BENZENE REMOVAL
IN THE
12'-10" OD X 5 HEARTH CARBON REACTIVATION FURNACE (RF-2)
FOR
EVOQUA WATER TECHNOLOGIES
PARKER, AZ FACILITY

Assumptions:

1) Inlet benzene concentration = 150,000 ppmwd.
2) Outlet benzene concentration <_ 10 ppmwd.

Given:

1) RF-2 capacity = 1200 lbs/hr dry regenerated carbon.

2) RF-2 carbon residence time = 37.8 minutes total at centershaft speed of one revolution per 54 seconds (50% on VFD).

3) Only vapor-phase carbon can contain 15% by weight benzene and is subject to 40CFR61, Subpart FF. Maximum adsorbate loading on vapor-phase carbon is thirty percent by weight (on-half of loading is benzene). Maximum adsorbate loading on liquid-phase carbon is only five percent by weight.

4) RF-2 furnace typical temperature profile during regeneration of vapor-phase carbon:

| | Gas Temperatures, °F |
|---|---|
| Hearth 1 | 500 |
| Hearth 2 | 700 |
| Hearth 3 | 1000 |
| Hearth 4 | 1400 |
| Hearth 5 | 1400 |

All temperatures shown are minimum values, actual gas phase temperatures during reactivation of vapor-phase carbons with 30 wt.% adsorbate loading will typically be 100°F to 500°F higher.

5) RF-2 is a 12'10" OD X 5 hearth furnace with a total of 356 $ft^2$ hearth area:

Hearth 1 = 60.0 $ft^2$
Hearth 2 = 77.0 $ft^2$
Hearth 3 = 60.0 $ft^2$
Hearth 4 = 77.0 $ft^2$
Hearth 5 = 81.5 $ft^2$

Total = 355.5 $ft^2$

6) The overall heat transfer coefficient, U, with the units of BTU/hr-$ft^2$-°F can be approximated by Tgas/100 in a multiple hearth furnace.

Calculate the location in RF-2 when carbon reaches the critical temperature for benzene (553°F):

Inlet benzene mass rate = 1200 lbs/hr X 150,000 ppmwd / 1,000,000
= 180 lbs/hr benzene

Outlet benzene mass rate <_ 1200 lbs/hr X 10 ppmwd / 1,000,000
<_ 0.012 lbs/hr benzene

Minimum benzene removal = 180 - 0.012 = 179.988 lbs/hr benzene
= (180 - 0.012)/180 X 100 = 99.993%

Calculate feed carbon composition:

Feed is 40% by weight water
Dry feed = 1,200 lbs/hr carbon + 180 lbs/hr benzene + 180 lbs/hr "other" adsorbate"
= 1,560 lbs/hr
Wet feed = 1,560/.60 = 2,600 lbs/hr
Water in feed = 2,600 - 1,560 = 1,040 lbs/hr

Hearth 1: hearth area = 60 $ft^2$, gas temp. = 500°F

Heat transfer to bed required to heat carbon, benzene and water to 134°F

$$Qbed = U \cdot A \cdot \Delta T$$

$$= 500/100 \cdot 60 \cdot \frac{[(500-60) - (500-134)]}{\ln [(500-60)/(500-134)]}$$

$= 5 \cdot 60 \cdot [(440 - 366) / \ln (440/366)]$

$= 5$ BTU/hr-ft²-°F $\cdot$ 60 ft² $\cdot$ 401.9°F

= 120,560 BTU/hr

Heat carbon, benzene, "other" adsorbate and water to 134°F:

$Qc = W \cdot Cp \cdot \Delta T$
= 1200 lbs/hr · 0.33 BTU/lb-°F · (134-60)°F
= 29,304 BTU/hr for carbon

$Qb = W \cdot Cp \cdot \Delta T$
= 180 lbs/hr · 0.50 BTU/lb-°F · (134-60)°F
= 6,660 BTU/hr for benzene

$Qo = W \cdot Cp \cdot \Delta T$
= 180 lbs/hr · 0.50 BTU/lb-°F · (134-60)°F
= 6,660 BTU/hr for "other" adsorbate

$Qw = W \cdot Cp \cdot \Delta T$
= 1,040 lbs/hr · 1 BTU/lb-°F · (134-60)°F
= 76,960 BTU/hr for water

$Qt = Qc + Qb + Qo + Qw = 29{,}304 + 6{,}660 + 6{,}660 + 76{,}960 = 119{,}584$ BTU/hr

Hearth 2: hearth area = 77 ft², gas temp. = 700°F

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Heat transfer to bed:

$Qbed = U \cdot A \cdot \Delta T$

$$= 700/100 \cdot 77 \cdot \frac{[(800-134) - (800-212)]}{\ln [(800-134)/(800-212)]}$$

$= 7 \cdot 77 \cdot [(566 - 488) / \ln (566/488)]$

$= 7$ BTU/hr-ft²-°F $\cdot$ 77 ft² $\cdot$ 526.0°F

= 283,534 BTU/hr

Heat carbon, benzene, "other" adsorbate and water from 134°F to 212°F:

$Qc = W \cdot Cp \cdot \Delta T$
$= 1200 \text{ lbs/hr} \cdot 0.33 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 30{,}888$ BTU/hr for carbon

$Qb = W \cdot Cp \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.50 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 7{,}020$ BTU/hr for benzene

$Qo = W \cdot Cp \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.50 \text{ BTU/lb-°F} \cdot (212-134)\text{°F}$
$= 7{,}020$ BTU/hr for "other" adsorbate

$Qw = W \cdot Cp \cdot \Delta T$
$= 1{,}040 \text{ lbs/hr} \cdot 1 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 81{,}120$ BTU/hr for water

$Qt = Qc + Qb + Qo + Qw = 30{,}888 + 7{,}020 + 7{,}020 + 81{,}120 = 126{,}048$ BTU/hr

Remaining energy to evaporate water:

$Qe = Qbed - Qt = 283{,}534 - 126{,}048 = 157{,}486$ BTU/hr

@ 212°F one pound of water requires 970 BTU/lb for evaporation

157,486 BTU/hr / 970 BTU/lb = 162.4 lbs/hr water evaporated from hearth 2

water remaining = 920 - 162.4 = 877.6 lbs/hr water

Hearth 3: hearth area = 60 ft$^2$, gas temp. = 1000°F

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Heat transfer to bed:

$Qbed = U \cdot A \cdot \Delta T$

$= 1000/100 \cdot 60 \cdot (1000 - 212)$

$= 10 \text{ BTU/hr-ft}^2\text{-°F} \cdot 60 \text{ ft}^2 \cdot 788\text{°F}$

$= 472{,}800$ BTU/hr

Evaporate water:

$472{,}800 \text{ BTU/hr} / 970 \text{ BTU/lb} = 487.4$ lbs/hr water evaporated from hearth 3

water remaining = $877.6 - 487.4 = 390.2$ lbs/hr water

Hearth 4: hearth area = 77 ft$^2$, gas temp. = 1400°F

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Evaporate remaining water:

$390.2 \text{ lbs/hr water} \cdot 970 \text{ BTU/lb} = 378{,}514 \text{ BTU/hr}$

Hearth area required to evaporate remaining water:

$A = Q / (U \cdot \Delta T)$

$= 378{,}514 \text{ BTU/hr} / [14 \text{ BTU/hr-ft}^2\text{-°F} \cdot (1400 - 212)\text{°F}$

$= 22.8 \text{ ft}^2$

Hearth area remaining = $77 - 22.8 = 54.2$ ft$^2$

Heat required to raise temperature of carbon, benzene, and "other" adsorbate from 212°F to 553°F:

$Q_c = W \cdot C_p \cdot \Delta T$
$= 1200 \text{ lbs/hr} \cdot 0.33 \text{ BTU/lb-°F} \cdot (553 - 212)\text{°F}$
$= 135{,}036$ BTU/hr for carbon

$Q_b = W \cdot C_p \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.33 \text{ BTU/lb-°F} \cdot (553 - 212)\text{°F}$
$= 30{,}060$ BTU/hr for benzene

$Q_b = W \cdot C_p \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.33 \text{ BTU/lb-°F} \cdot (553 - 212)\text{°F}$
$= 30{,}060$ BTU/hr for "other" adsorbate

$Q_t = Q_c + Q_b = 135{,}036 + 30{,}060 + 30{,}060 = 196{,}416$ BTU/hr

Hearth area required to temperature of carbon and benzene to 553°F:

$A = Q / (U \cdot \Delta T)$

$$= 196{,}416 \,/\, \left(14 \cdot \frac{[(1400\text{-}212) - (1400\text{-}553)]}{\ln\,[(1400\text{-}212)/(1400\text{-}553)]}\right)$$

$$= 196{,}416 \,/\, (14 \cdot [(118 - 847) \,/\, \ln\,(1108/847)])$$

$$= 196{,}416 \text{ BTU/hr} \,/\, (14 \text{ BTU/hr-ft}^2\text{-°F} \cdot 1007.9\text{°F})$$

$$= 13.9 \text{ ft}^2$$

Hearth area remaining = 54.2 - 13.9 $ft^2$ = 40.3 $ft^2$

Percentage of hearth 4 area remaining = 40.3 / 77 · 100 = 52 %

After 4½ minutes on hearth 4 of RF-2, temperature of the carbon, benzene and "other" adsorbate is above 553°F (the critical temperature for benzene). By definition, benzene cannot be liquefied (adsorbed) by pressure alone above this temperature and exerts a vapor pressure in excess of 60 atmospheres. The carbon remains above the critical temperature for an additional 12½ minutes until discharged from the furnace.

Due to the extreme volatility of benzene at elevated temperatures and the length of time at which the carbon is subjected to temperatures above the critical temperature for benzene, all benzene is removed (vaporized) from the carbon prior to discharge from RF-2. Since gas flow is counter-current to solids flow in a multiple hearth furnace and the lower half of the furnace is maintained above the critical temperature of benzene, there is no possibility of desorbed benzene being re-adsorbed onto the reactivated product.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 1 | H-1 Hopper Waste Feed Closed | | | | | | | |
| 2 | H-1 Hopper Eductor, Piping and Victaulics | | | | | | | |
| 3 | H-1 Hopper Flanges, Piping and Victaulics | | | | | | | |
| 4 | H-1 Hopper Vault Door | | | | | | | |
| 5 | H-2 Hopper Waste Feed Closed | | | | | | | |
| 6 | H-2 Hopper Eductor Flanges and Victaulics | | | | | | | |
| 7 | H-2 Hopper Piping and Victaulics | | | | | | | |
| 8 | RF-2 Hearth 1 Door West | | | | | | | |
| 9 | RF-2 Seal Welded Flat - between 1 and 2 | | | | | | | |
| 10 | RF-2 Hearth 2 Door East | | | | | | | |
| 11 | RF-2 Seal Welded Flat - between 2 and 3 | | | | | | | |
| 12 | RF-2 Hearth 3 Door East | | | | | | | |
| 13 | RF-2 Seal Welded Flat - between 3 and 4 | | | | | | | |
| 14 | RF-2 Hearth 4 Door East | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 15 | RF-2 Seal Welded Flat - between 4 and 5 | | | | | | | |
| 16 | RF-2 Hearth 5 Door East | | | | | | | |
| 17 | RF-2 Welded Seam on Furnace Bottom | | | | | | | |
| 18 | RF-2 Top Sand Seal | | | | | | | |
| 19 | RF-2 Bottom Sand Seal | | | | | | | |
| 20 | RF-2 Carbon Outlet Piping and Flanges | | | | | | | |
| 21 | T-1 Ball Valves | | | | | | | |
| 22 | T-1 Couplings | | | | | | | |
| 23 | T-1 Eductor & Fittings | | | | | | | |
| 24 | T-1 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 25 | T-1 Fittings & Valves | | | | | | | |
| 26 | T-1 (SEE ATTACHMENT No. 1) | | | | | | | |
| 27 | T-1 Pressure Relief Valve | | | | | | | |
| 28 | T-1 Slurry Line | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 29 | T-1 Tank Flanges | | | | | | | |
| 30 | T-1 Vent Pipe To WS-1 | | | | | | | |
| 31 | T-2 Ball Valves | | | | | | | |
| 32 | T-2 Couplings | | | | | | | |
| 33 | T-2 Eductor & Fittings | | | | | | | |
| 34 | T-2 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 35 | T-2 Fittings & Valves | | | | | | | |
| 36 | T-2 Tank (SEE ATTACHMENT No. 1) | | | | | | | |
| 37 | T-2 Pressure Relief Valve | | | | | | | |
| 38 | T-2 Slurry Line | | | | | | | |
| 39 | T-2 Tank Flanges | | | | | | | |
| 40 | T-2 Vent Pipe To WS-1 | | | | | | | |
| 41 | T-5 Ball Valves | | | | | | | |
| 42 | T-5 Couplings | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

## Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 43 | T-5 Eductor & Fittings | | | | | | | |
| 44 | T-5 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 45 | T-5 Fittings & Valves | | | | | | | |
| 46 | T-5 (SEE ATTACHMENT No. 2) | | | | | | | |
| 47 | T-5 Pressure Relief Valve | | | | | | | |
| 48 | T-5 Slurry Line | | | | | | | |
| 49 | T-5 Tank Flanges | | | | | | | |
| 50 | T-5 Vent Pipe To WS-1 | | | | | | | |
| 51 | T-6 Ball Valves | | | | | | | |
| 52 | T-6 Couplings | | | | | | | |
| 53 | T-6 Eductor & Fittings | | | | | | | |
| 54 | T-6 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 55 | T-6 Fittings & Valves | | | | | | | |
| 56 | T-6 (SEE ATTACHMENT No. 2) | | | | | | | |

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**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 57 | T-6 Pressure Relief Valve | | | | | | | |
| 58 | T-6 Slurry Line | | | | | | | |
| 59 | T-6 Tank Flanges | | | | | | | |
| 60 | T-6 Vent Pipe To WS-1 | | | | | | | |
| 61 | T-9 (SEE ATTACHMENT No. 3) | | | | | | | |
| 62 | T-9 Level Transmitter | | | | | | | |
| 63 | T-9 Main Bottom Manway Door | | | | | | | |
| 64 | T-9 Return Line and Fittings From T Tanks | | | | | | | |
| 65 | T-9 Return Line and Fittings From T-18 | | | | | | | |
| 66 | T-9 Sump Pump Fittings | | | | | | | |
| 67 | T-9 Vent Line and Fittings To WS-1 | | | | | | | |
| 68 | T-9/P-4 Pump - Inlet Pipe and Fittings | | | | | | | |
| 69 | T-9/P-5 Pump - Inlet Pipe and Fittings | | | | | | | |
| 70 | T-9/P-4 Pump - Outlet Pipe and Fittings | | | | | | | |

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Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 71 | T-9/P-5 Pump - Outlet Pipe and Fittings | | | | | | | |
| 72 | T-18 Feed Hose & Couplings | | | | | | | |
| 73 | T-18 Feed Valve & Piping | | | | | | | |
| 74 | T-18 Level Indicators | | | | | | | |
| 75 | T-18 Lids (SEE ATTACHMENT No. 4) | | | | | | | |
| 76 | T-18 Return Line, Couplings and Vics | | | | | | | |
| 77 | T-18 Piping and Couplings From T-Tanks | | | | | | | |
| 78 | WS-1 Hatches & Sample Port | | | | | | | |
| 79 | WS-1 Inlet | | | | | | | |
| 80 | WS-1 Outlet | | | | | | | |
| 81 | WS-3 Hatches & Sample Port | | | | | | | |
| 82 | WS-3 Inlet | | | | | | | |
| 83 | WS-3 Outlet | | | | | | | |
| 84 | Dewater Screw (SEE ATTACHMENT No. 4) | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

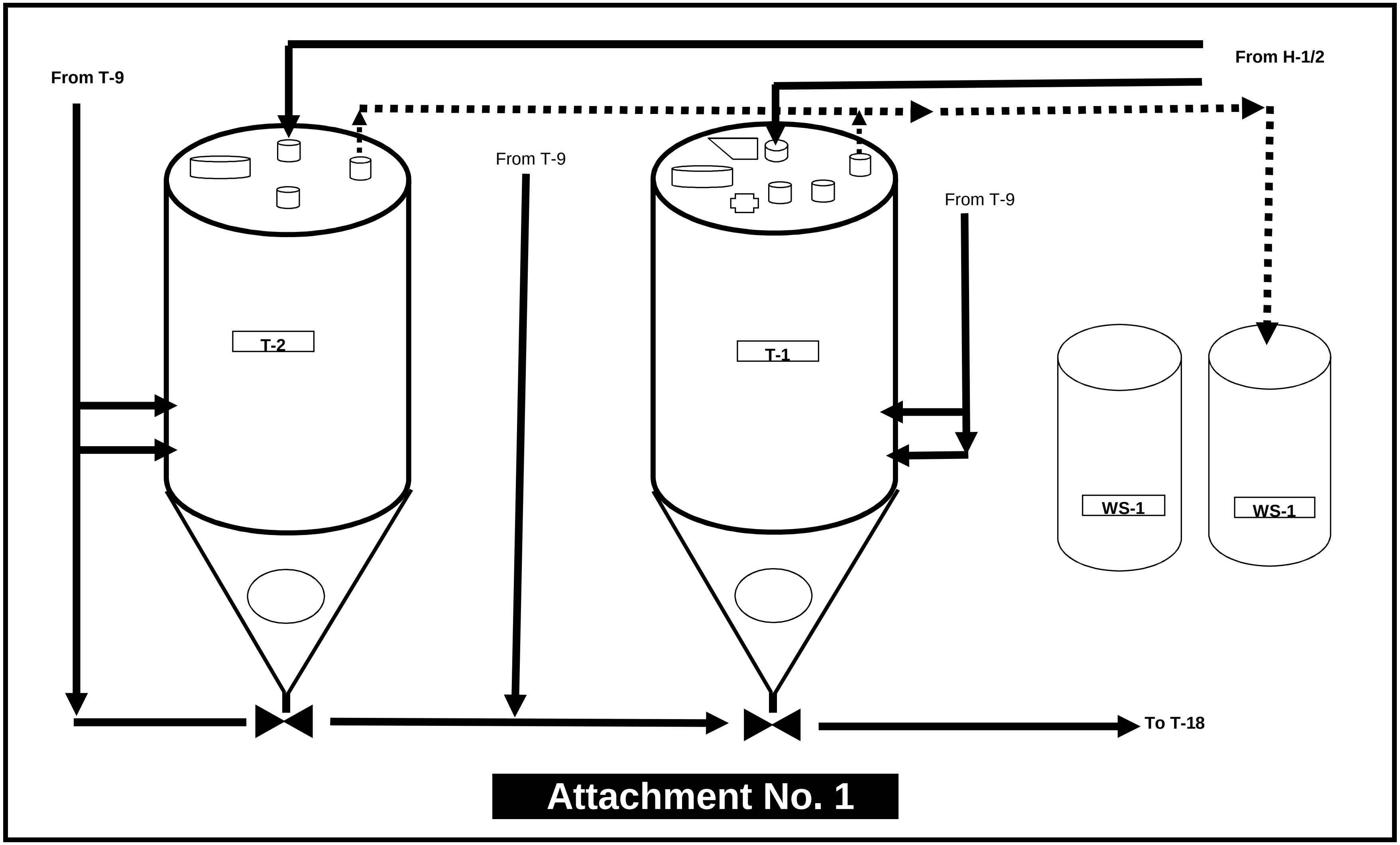
**40 CFR 61.343, 345, 349**

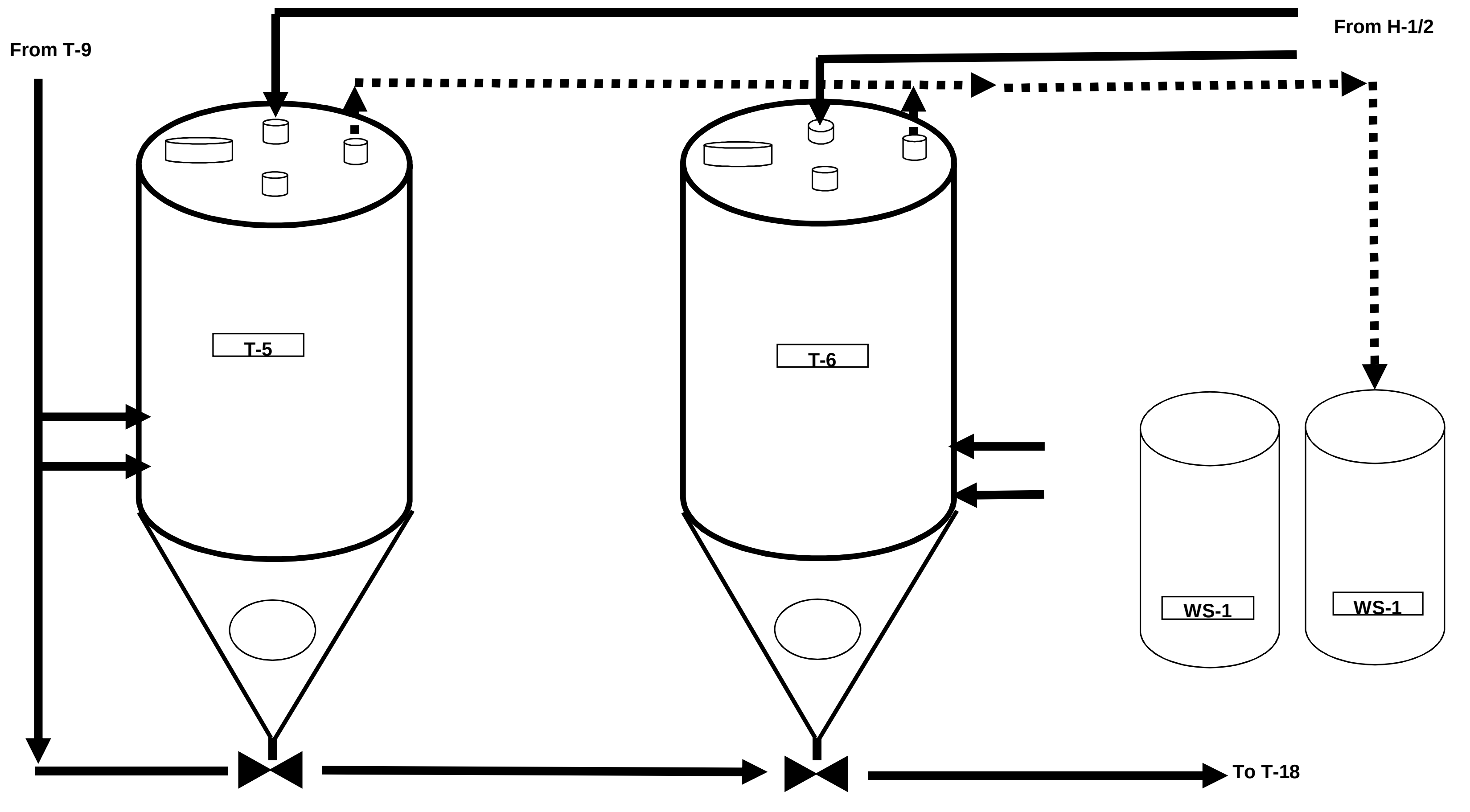
**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 85 | Weigh Belt Feeder (SEE ATTACHMENT No. 4) | | | | | | | |
| 86 | Rotary Valve (SEE ATTACHMENT No. 4) | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | | | | |
| 89 | | | | | | | | |
| 90 | | | | | | | | |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | | | | |
| 94 | | | | | | | | |

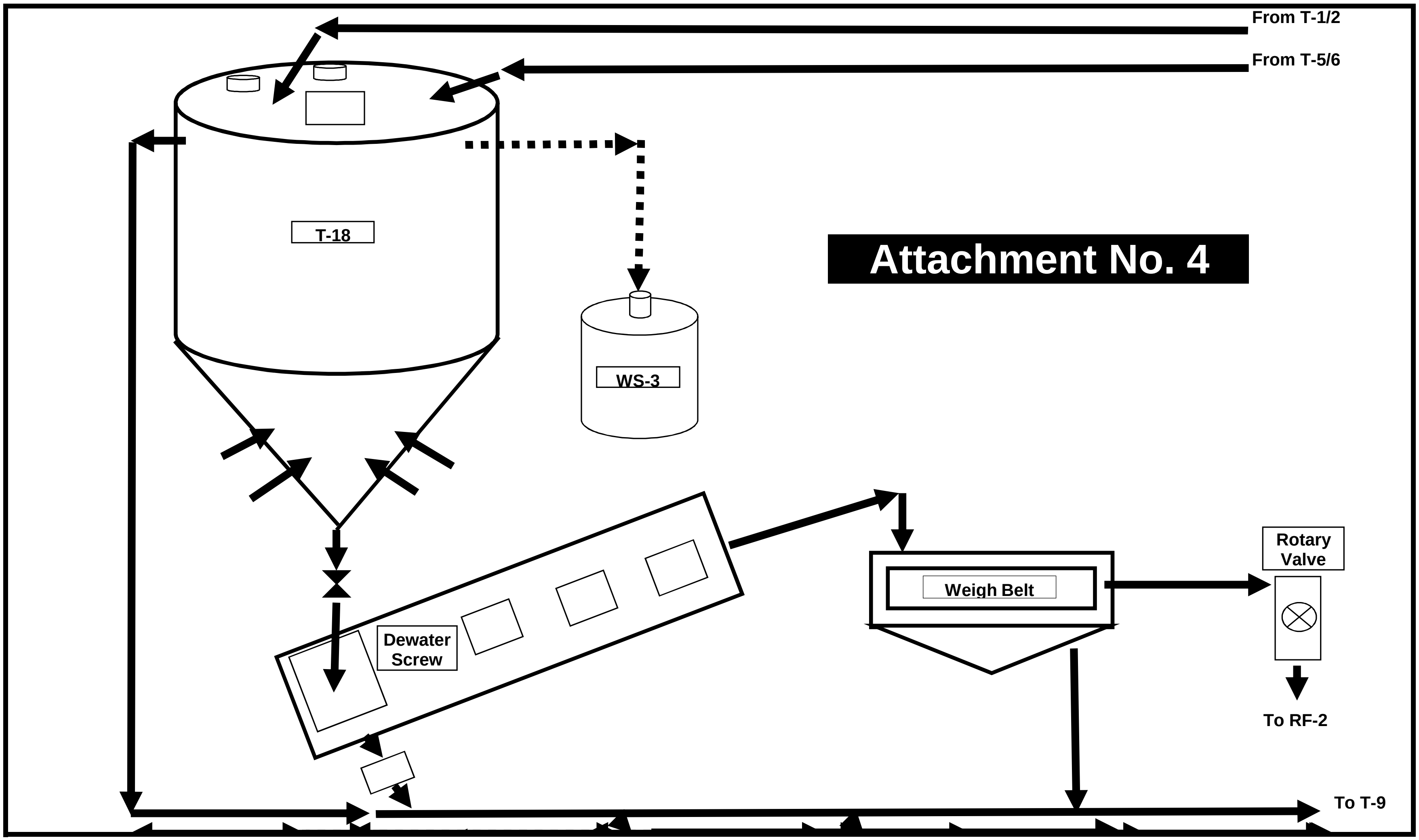


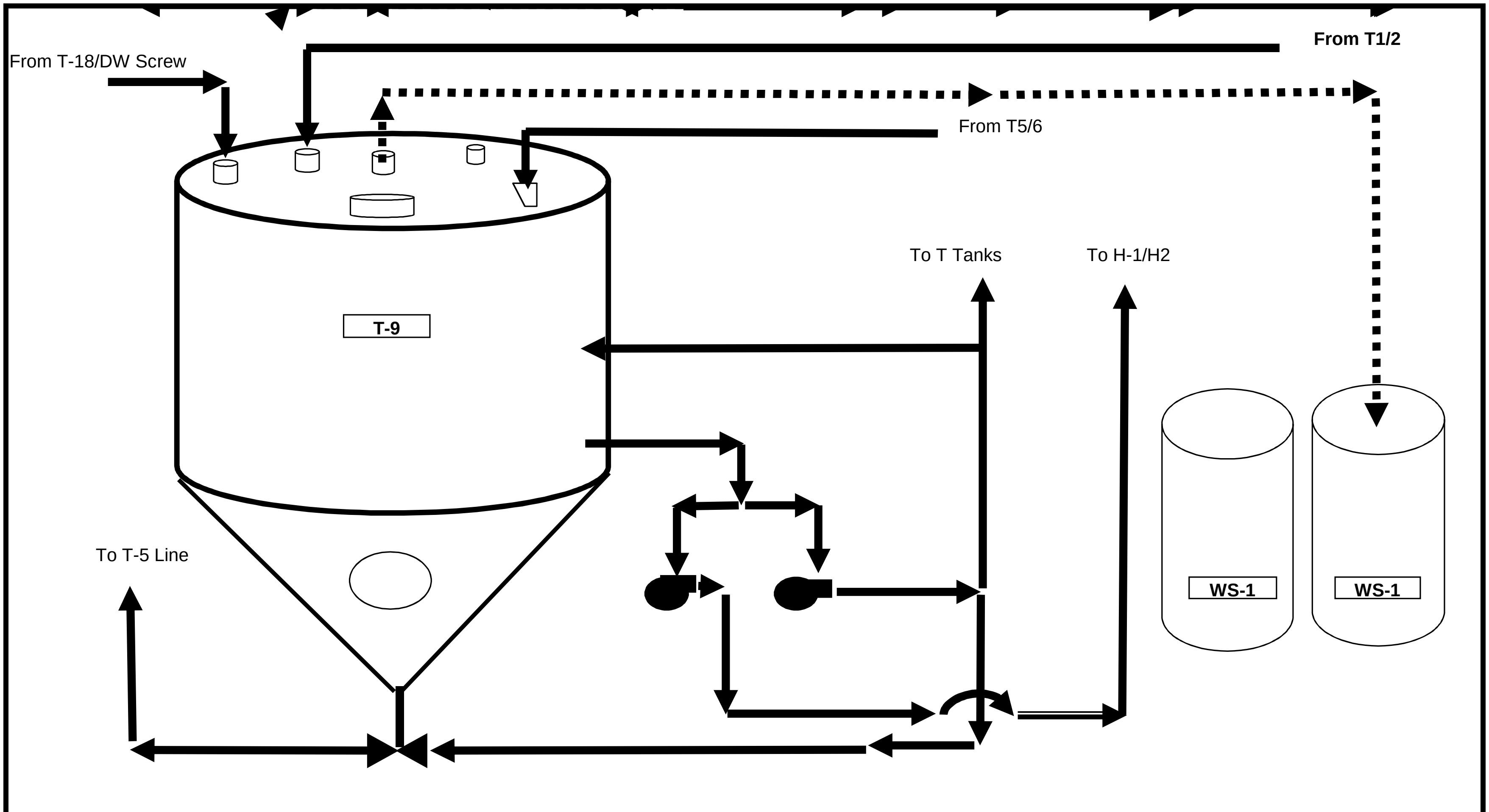
*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.


From H-1/2
From T-9
From T-9
From T-9
T-2
T-1
WS-1
WS-1
To T-18
Attachment No. 1




**Attachment No. 2**


From T-1/2
From T-5/6
T-18
WS-3
Attachment No. 4
Dewater Screw
Weigh Belt
Rotary Valve
To RF-2
To T-9




**Attachment No. 3**

## Evoqua Water Technologies

# Benzene Neshap Quarterly Inspection

**Process Equipment Assessment For Potential Air Emissions -- 40 CFR 61.343, 345, 348**

**Quarter:__________________ Year:________________**

| Equipment Description | Mechanical Integrity | Corrective Action Or Maintenance | Reviewed By | Review Date |
|---|---|---|---|---|
| **Carbon Adsorber WS-1** | Breach in container, visible leakage, or corrosion? Yes ☐ No ☐<br>Carbon replacement within specified time period? Yes ☐ No ☐<br>Carbon replacement dates recorded? Yes ☐ No ☐<br>(As verified against " Carbon Canister Replacement Log") | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Carbon Adsorber WS-3** | Breach in container, visible leakage, or corrosion? Yes ☐ No ☐<br>Carbon replacement within specified time period? Yes ☐ No ☐<br>Carbon replacement dates recorded? Yes ☐ No ☐<br>(As verified against " Carbon Canister Replacement Log") | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Drums, Vessels or Bags In Storage** | All drums/vessels sealed? Yes ☐ No ☐<br>Breach in drums/vessels, visible leakage or corrosion? Yes ☐ No ☐<br>Any bags torn or leaking? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Recycle and Spent Carbon Tanks** | T-1 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-2 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-5 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-6 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-9 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-18 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Dewater Screw** | Any visible fugitive emissions or leakage? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Afterburner** | Temperature at or above 1800 F at all times? Yes ☐ No ☐<br>(As verified against the afterburner temperature on the process monitoring logs) | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Slurry Piping** | Any corrosion? Yes ☐ No ☐<br>Any leakage? Yes ☐ No ☐<br>Any cracking or metal fatigue? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **H-1 and H-2 Waste Feed Cutoff Seal (Cover)** | H-1 WFCO Valve Seal? Yes ☐ No ☐<br>H-2 WFCO Valve Seal Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |

| 4000 lbs | WS-1 (7.8 Days) | | | | |
|---|---|---|---|---|---|
| Periodic Test Before Changeout | Change Out | Last Change | Days | Day | Carbon Used for Change Out |
| | 3/4/2019 | 2/25/2019 | 7 | Mon | VCRS |
| | 3/11/2019 | 3/4/2019 | 7 | Mon | VCRS |
| | 3/18/2019 | 3/11/2019 | 7 | Mon | VCRS |
| | 3/25/2019 | 3/18/2019 | 7 | Mon | VCRS |
| | 4/1/2019 | 3/25/2019 | 7 | Mon | VCRS |
| | 4/8/2019 | 4/1/2019 | 7 | Mon | VCRS |
| | 4/15/2019 | 4/8/2019 | 7 | Mon | VCRS |
| | 4/22/2019 | 4/15/2019 | 7 | Mon | VCRS |
| | 4/29/2019 | 4/22/2019 | 7 | Mon | VCRS |
| | 5/6/2019 | 4/29/2019 | 7 | Mon | VCRS |
| | 5/13/2019 | 5/6/2019 | 7 | Mon | VCRS |
| | 5/20/2019 | 5/13/2019 | 7 | Mon | VCRS |
| | 5/27/2019 | 5/20/2019 | 7 | Mon | VCRS |
| | 6/3/2019 | 5/27/2019 | 7 | Mon | VCRS |
| | 6/10/2019 | 6/3/2019 | 7 | Mon | VCRS |
| | 6/17/2019 | 6/10/2019 | 7 | Mon | VCRS |
| | 6/24/2019 | 6/17/2019 | 7 | Mon | VCRS |
| | 7/1/2019 | 6/24/2019 | 7 | Mon | VCRS |
| | 7/8/2019 | 7/1/2019 | 7 | Mon | VCRS |
| | 7/15/2019 | 7/8/2019 | 7 | Mon | VCRS |

| 1000 lbs | WS-3 (38 days) | | | |
|---|---|---|---|---|
| Periodic Test Before Changeout | Change Out | Last Change | Days | Carbon Used for Change Out |
| | 8/1/18 | 7/2/2018 | 30 | VCRS |
| | 8/31/18 | 8/1/2018 | 30 | VCRS |
| | 10/1/18 | 8/31/2018 | 31 | VCRS |
| | 11/1/18 | 10/1/2018 | 31 | VCRS |
| | 11/30/18 | 11/1/2018 | 29 | VCRS |
| | 12/26/18 | 11/30/2018 | 26 | VCRS |
| | 2/1/19 | 12/26/2018 | 37 | VCRS |
| | 3/1/19 | 2/1/2019 | 28 | VCRS |
| | 4/1/19 | 3/1/2019 | 31 | VCRS |
| | 4/30/19 | 4/1/2019 | 29 | VCRS |
| | 5/30/19 | 4/30/2019 | 30 | VCRS |
| | 7/1/19 | 5/30/2019 | 32 | VCRS |

# CLEAN VERSIONS



Revisions October 2019

PERMIT ATTACHMENT

# APPENDIX IV

## WASTE ANALYSIS PLAN

**Evoqua Water Technologies**
**2523 Mutahar Street**
**Parker, Arizona  85344**

**October 2019**
**Revision 4**

## TABLE OF CONTENTS

## LIST OF TABLES



## LIST OF FIGURES



## LIST OF APPENDICES



Note that the appendices are included with the WAP for informational purposes and represent examples of the types of information contained in these documents. The actual documents may be modified from time to time as deemed necessary by the facility, without changing the WAP.

# 1.0 INTRODUCTION

This Waste Analysis Plan has been prepared for the Evoqua Water Technologies (EWT) carbon reactivation facility located in Parker, Arizona. It is intended to comply with the waste analysis requirements found in 40 CFR Part 264.13 and 265.13. A description of the facility can be found in Section D of the facility's RCRA Part B permit application. This Waste Analysis Plan applies only to spent carbon that is classified as hazardous waste in accordance with 40 CFR Part 261.

The procedures and information that make up this document establish EWT’s policy for the acceptance of spent carbon classified as hazardous waste and the analysis of spent carbon. The forms contained in this Waste Analysis Plan are offered to establish the general information to be documented. The format and wording of these forms may be changed from time to time without modifying the Waste Analysis Plan. EWT will provide copies of these forms to EPA as they are revised.

All records are retained in accordance with the recordkeeping requirements of 40 CFR 264.73. EWT’s records retention requirements are summarized in Appendix XXI.

## 2.0 INFORMATION SUPPLIED BY HAZARDOUS WASTE GENERATORS

Spent carbon processed at the EWT facility will be received only after it is pre-approved for processing by EWT as described below.

The prospective generator (originator) of a source of spent carbon will begin the approval process by making application to EWT using a Spent Carbon Profile Form (SCPF). The generator will complete the SCPF in accordance with the guidance supplied with each form. The information supplied by the generator must be from analysis of a sample which is representative of the spent carbon being profiled. An example of a SCPF can be found in Appendix A.

Section 3 of the SCPF provides space for the generator to provide a specific description of the process generating the spent carbon including constituents being treated. A copy of the analytical data must be included with the SCPF.

EWT will perform a completeness review on each SCPF. Should any deficiencies be found, EWT will work with the generator to ensure the SCPF is complete before proceeding with the pre-acceptance process.

In order to ensure proper storage and treatment of the spent carbon, at a minimum, the pre-acceptance parameters listed in Table 4-1 will be determined for all samples before final profile approval is given. Table 4-1 also lists the rationale for the analyses chosen as well as the analytical methods to be used. EWT will make a determination of what additional analyses, if any, will be performed based on the information supplied on the SCPF. As part of the profiling process, the generator must make a determination and indicate in the space provided on the SCPF that based on analytical data of the waste stream and/or their knowledge of the process producing the spent carbon whether the spent carbon is a hazardous waste as defined by 40 CFR Part 261. In all cases where a determination has been made that the spent carbon is a RCRA hazardous waste, the generator is required to provide analytical data for characterization.

Based on the information supplied on the SCPF and the results of the spent carbon analysis, the generator's spent carbon will either be approved or rejected for treatment at the Parker facility. The decision to approve or reject a generator's spent carbon will be made by EWT plant management. The generator will be advised of the determination. If the spent carbon is approved for treatment, the spent carbon will be assigned a spent carbon approval number.

The generator is required to submit a revised SCPF (including appropriate analytical data) whenever there is reason to believe that the nature of the spent carbon has changed (e.g., from process or operational modifications). At a minimum, each generator must submit an updated SCPF and current analytical data at least every two years. Analytical data submitted with the profile information must be no more than 6 months old.

In the case where EWT discovers that a shipment of spent carbon exhibits a significant discrepancy from the waste profile information, the generator will be required to re-characterize the waste and may also be required to develop a new waste profile (including appropriate analytical data), before the shipment will be accepted for treatment.

## 3.0 PROCEDURES USED TO INSPECT SPENT CARBON RECEIVED

Upon arrival at the facility, each load will be inspected by a Material Handler or other qualified person to ensure the material is spent carbon and that the quantity of spent carbon agrees with the quantity stated on each manifest. For loads of containerized spent carbon, the drums or other containers will be counted to ensure that the quantity agrees with the manifest. Each container will be checked to ensure that a correctly completed hazardous waste label is present and that the label agrees with the contents stated on the manifest. After the quantity check, samples of the containerized spent carbon will be obtained as described in Section 5.

Bulk shipments will also be inspected. The manways or "domes" will be opened and the depth of the carbon will be visually inspected. The estimated quantity or volume in the truck will be compared with the quantity listed on the Hazardous Waste Manifest. After the quantity check, samples of the tank contents will be obtained as described in Section 5.

In the event further testing is required to make a decision or characterize the spent carbon, the facility may temporarily store the material pending analytical results.

An Incoming Spent Carbon Tally Sheet/On-Site Screening Report (see Appendix B) will be completed for each load by a Material Handler or other qualified person. This form will be filed and maintained as part of the facility's Operating Record.

# 4.0 CONFIRMATION OF COMPOSITION OF SPENT CARBON RECEIVED

As discussed in Section 2 of this document, the spent carbon generator is required to provide certain characterization and analytical data to SWT, prior to waste acceptance at the facility. Analytical data to be provided by the generator, including the rationale for the analysis, and the appropriate analytical methods, are described in Table 4-1.

The remainder of this section describes how facility personnel confirm that the materials received correspond to the pre-acceptance data supplied by the generator, and how facility personnel sample and analyze the incoming materials to confirm compliance with feed rate restrictions on the carbon reactivation unit. The locations within the facility and the carbon reactivation process where samples are collected are shown schematically in Figure 4-1.

## 4.1 CONTAINERIZED SPENT CARBON

Each container of spent carbon will be opened by a Material Handler or other qualified person, and the contents of the container will be visually inspected for foreign matter. The general appearance of the carbon will be observed. As described in the sampling procedure (see Section 5) representative samples will be obtained. A composite of the spent carbon samples from each load from each generator, or a single sample if only one container was received from the generator, will be subjected to the on-site screening tests listed in Table 4-2.

## 4.2 BULK SPENT CARBON

Each bulk load of spent carbon will be sampled by a Material Handler or other qualified person, as described in Section 5. Representative samples of the bulk load will be obtained as described in the sampling procedure in Section 5.0. The samples will be visually inspected for general appearance and the presence of foreign matter. A composite of the spent carbon samples will be subjected to the on-site screening tests listed in Table 4-2.

## 4.3 ON-SITE SCREENING

The composite samples obtained from each load from each generator's containerized spent carbon shipment and from bulk loads will be subjected to the on-site screening analyses listed in Table 4-2. EWT's procedures for on-site screening are provided in Appendix C to the WAP. The results of the analyses will be recorded on the Incoming Spent Carbon Waste Tally Sheet and On-Site Screening Report (see Appendix B) by trained personnel and reviewed by plant management. If the spent carbon is accepted, the spent carbon will be transferred into a designated storage tank or container storage area.

If, based on the visual inspection and the on-site screening analyses, the spent carbon is different than that described on the customer Spent Carbon Profile Form and/or the

Hazardous Waste Manifest, the generator will be notified of the discrepancy. If the discrepancy cannot be immediately resolved, the spent carbon may be retained on-site while the investigation of the discrepancy continues. If the discrepancy cannot be resolved, the spent carbon will be rejected and directed back to the generator or an alternate facility per generator direction. If the discrepancy cannot be resolved within 15 days, EWT will notify EPA as required by 40 CFR 264.72(b) and (c).

## 4.4 RATIONALE FOR ANALYSES SELECTED FOR ON-SITE SCREENING

The rationale for the analysis selected to be performed as part of the on-site screening is given in Table 4-2.

## 4.5 ANALYSES PERFORMED FOR PERMIT COMPLIANCE

The RF-2 carbon reactivation furnace conducted a Performance Demonstration Test and established feed rate limits for the following constituents as a result of that test:

- Mercury
- Semi volatile metals (cadmium, lead)
- Low volatility metals (arsenic, beryllium, chromium)
- Total chlorine/chloride
- Sulfur

In order to continuously demonstrate compliance with the mercury, SVM, LVM and chorine feed rate limits, the most recent analytical results (designated as the “analysis of record”) are recorded in the process computer system. A rolling average feed rate of each regulated constituent is computed and recorded based on the analysis of record and the measured mass feed rate of spent activated carbon.

In order to demonstrate compliance with $SO_2$ emission limits of 30 tons per year, the average monthly results for sulfur will be used to calculate the 12-month rolling average.

The following formula will be used:

$$(\text{Feed Rate} \times \text{Operating Hours} \times (64/32) \times \%\,\text{Sulfur} \times (1-.90)) / 2000 = SO_2\ \text{Tons/Year}$$

Based on maximum spent carbon feed rate, maximum operating hours in a year and a scrubber control efficiency of 90%, the maximum sulfur loading on the spent carbon cannot exceed 11,232 mg/kg.

A grab sample of the feed spent activated carbon is collected four times daily (twice each shift) when the process is operating. These samples are collected by the process operators from the weigh belt. The four daily grab samples are stored in the on-site laboratory. At the end of each approximately 15 to 20 day period (selected such that the samples will not exceed the 28 day holding time for Hg analysis), the samples collected from that time period are combined and then sub-sampled to form a composite feed sample. This composite is analyzed using the methods described in Table 4-3.

Following receipt of the feed composite sample analyses, the data are entered into a spreadsheet where the most recent 12 months of analytical results are averaged. When each new analytical result is entered, the 12-month average is updated. The most recent 12-month average result is designated as the "analysis of record" for purposes of calculating the constituent feed rate values used for permit compliance demonstration.

While EWT's contract laboratory matrix spike recovery results are routinely within the method limits, EPA has expressed concern that analyte recovery may be problematic in activated carbon samples. EWT has agreed to review the results of matrix spike recoveries for the regulatory compliance analyses (metals and total chlorine) and to adjust the analytical result using the spike recovery if the recovery falls below the method limits. The following equation will be used if such analytical result adjustment is needed:

$$C_{corr} = C_{unc} \times \frac{100}{Spike\ Recovery\ \%}$$

Where:

$C_{corr}$ = Corrected analytical result
$C_{unc}$ = Uncorrected analytical result

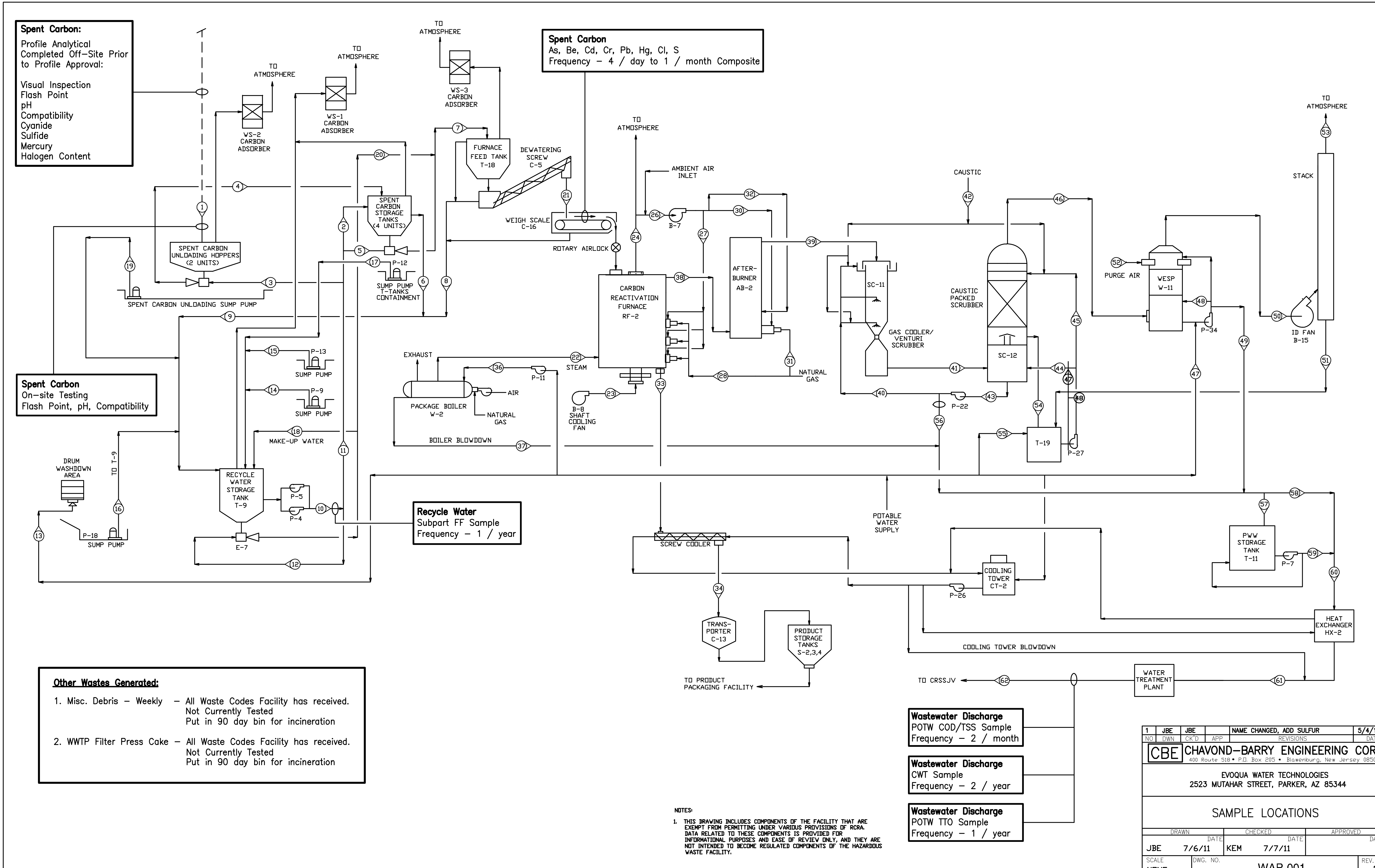

Spent Carbon:
Profile Analytical Completed Off-Site Prior to Profile Approval:
Visual Inspection
Flash Point
pH
Compatibility
Cyanide
Sulfide
Mercury
Halogen Content
Spent Carbon
As, Be, Cd, Cr, Pb, Hg, Cl, S
Frequency – 4 / day to 1 / month Composite
Spent Carbon
On-site Testing
Flash Point, pH, Compatibility
Recycle Water
Subpart FF Sample
Frequency – 1 / year
Wastewater Discharge
POTW COD/TSS Sample
Frequency – 2 / month
Wastewater Discharge
CWT Sample
Frequency – 2 / year
Wastewater Discharge
POTW TTO Sample
Frequency – 1 / year
Other Wastes Generated:
1. Misc. Debris – Weekly – All Waste Codes Facility has received. Not Currently Tested Put in 90 day bin for incineration
2. WWTP Filter Press Cake – All Waste Codes Facility has received. Not Currently Tested Put in 90 day bin for incineration
TO ATMOSPHERE
WS-2 CARBON ADSORBER
WS-1 CARBON ADSORBER
WS-3 CARBON ADSORBER
FURNACE FEED TANK T-18
DEWATERING SCREW C-5
SPENT CARBON STORAGE TANKS (4 UNITS)
SPENT CARBON UNLOADING HOPPERS (2 UNITS)
SPENT CARBON UNLOADING SUMP PUMP
P-12
SUMP PUMP T-TANKS CONTAINMENT
WEIGH SCALE C-16
ROTARY AIRLOCK
AMBIENT AIR INLET
B-7
CARBON REACTIVATION FURNACE RF-2
AFTER-BURNER AB-2
SC-11
GAS COOLER/ VENTURI SCRUBBER
CAUSTIC
CAUSTIC PACKED SCRUBBER
SC-12
PURGE AIR
WESP W-11
P-34
STACK
ID FAN B-15
P-13 SUMP PUMP
P-9 SUMP PUMP
MAKE-UP WATER
EXHAUST
STEAM
P-11
AIR
PACKAGE BOILER W-2
NATURAL GAS
B-8 SHAFT COOLING FAN
BOILER BLOWDOWN
P-22
T-19
P-27
DRUM WASHDOWN AREA
TO T-9
P-18 SUMP PUMP
RECYCLE WATER STORAGE TANK T-9
P-5
P-4
E-7
POTABLE WATER SUPPLY
SCREW COOLER
COOLING TOWER CT-2
P-26
PWW STORAGE TANK T-11
P-7
HEAT EXCHANGER HX-2
COOLING TOWER BLOWDOWN
TRANS-PORTER C-13
PRODUCT STORAGE TANKS S-2,3,4
TO PRODUCT PACKAGING FACILITY
TO CRSSJV
WATER TREATMENT PLANT
NOTES:
1. THIS DRAWING INCLUDES COMPONENTS OF THE FACILITY THAT ARE EXEMPT FROM PERMITTING UNDER VARIOUS PROVISIONS OF RCRA. DATA RELATED TO THESE COMPONENTS IS PROVIDED FOR INFORMATIONAL PURPOSES AND EASE OF REVIEW ONLY, AND THEY ARE NOT INTENDED TO BECOME REGULATED COMPONENTS OF THE HAZARDOUS WASTE FACILITY.
1 JBE JBE NAME CHANGED, ADD SULFUR 5/4/16
NO DWN CK'D APP REVISIONS DATE
CBE CHAVOND–BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504
EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344
SAMPLE LOCATIONS
DRAWN DATE CHECKED DATE APPROVED DATE
JBE 7/6/11 KEM 7/7/11
SCALE NONE
DWG. NO. WAP-001
REV. 1
PRINT DATE: 5/4/16
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TABLE 4-1
SUMMARY OF PRE-ACCEPTANCE ANALYTICAL PARAMETERS, RATIONALE, AND TEST METHODS

| PARAMETER | RATIONALE | METHODS | USES |
|---|---|---|---|
| Visual Inspection | Verify that the material is spent carbon, and used to identify the obvious presence or absence of free liquid and/or debris, coloration, and whether the spent carbon is a vapor phase or liquid phase carbon, etc. The initial characterization of a particular spent carbon will be used for comparison against each subsequent load of that same spent carbon received at the facility. | Visual Inspection | Pre-acceptance |
| Flash-point (1) | Indicates whether the free liquid or solid portion of the spent carbon exhibits the characteristics of ignitability. This information is used to determine the storage requirements for the spent carbon prior to treatment. Liquids with a flash point <140ºF will not be accepted into the facility. | SW-846 Method 1010M, 1010, or ASTM D3278 | Pre-acceptance |
| pH (2) | Identifies materials that have the potential to corrode pipes, tanks and ancillary equipment. | SW-846 Method 9041, 9040, or 9045 depending on free moisture in sample | Pre-acceptance |
| Compatibility | Identifies materials that have the potential to be incompatible. | ASTM D5058 (Method C) or IM-101S | Pre-acceptance |
| Cyanide | Identifies potentially reactive spent carbon. Spent carbon with reactive cyanide >250ppm will not be accepted at the facility. | SW-846 Method 9010 | Pre-acceptance |
| Sulfide | Identifies potentially reactive spent carbon. Spent carbon with reactive sulfide >500ppm will not be accepted at the facility. | SW-846 Method 9030 | Pre-acceptance |
| Mercury | Process information. | SW-846 Method 7471 (Cold Vapor Technique) | Pre-acceptance |
| Halogen Content | Process information. | SW-846 Method 5050 (bomb combustion)<br>SW-846 Method 9252A | Pre-acceptance |

Notes:
1. If fingerprinting with an open flame is positive then run one of the methods.
2. Analysis performed on free liquids retained in incoming spent carbon samples or on a 1:1 mixture of the incoming vapor phase carbon sample and deionized water. Initial screening is performed using Method 9041. Should Method 9041 indicate the sample is potentially corrosive, Method 9040 or Method 9045 is used for final confirmation that a material is corrosive.
3. All method numbers are shown without suffix. The latest promulgated method will be used.
4. SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update. ASTM refers to *Annual Book of ASTM Standards*, ASTM International.

Table 4-2
SUMMARY OF ON-SITE SCREENING ANALYTICAL PARAMETERS, RATIONALE AND TEST METHODS

| PARAMETER | RATIONALE | METHODS | USES |
|---|---|---|---|
| Visual Inspection | Verify that the material is spent carbon, and used to identify the obvious presence or absence of free liquid and/or debris, coloration, and whether the spent carbon is a vapor phase or liquid phase carbon. | Visual | On-site screening;<br>Must conform to physical description on profile |
| Ignitability(1) | Indicates whether the carbon will support a flame at ambient conditions. This information is used to determine the storage requirements for the spent carbon prior to treatment, and to verify ignitability information provided by the generator. | Open ignition in controlled environment | On-site screening;<br>Diluted sample must not support combustion |
| pH | Identifies materials that have the potential to corrode pipes, tanks and ancillary equipment. | Add DI water 1:1 and check pH using test strips. (Reference: EPA Method 9041M/9045M) | On-site screening;<br>Must be within range on profile |
| Compatibility | Identifies materials that have the potential to be incompatible with water. | ASTM D5058 (Test Method C – Water Compatibility) or IM-101S | On-site screening;<br>Must not show adverse reaction with water |

Notes:

(1) Fingerprinting is conducted by applying a flame to the carbon sample in a controlled environment. If the carbon supports a flame under these conditions, the sample is mixed 1:1 with deionized water and the procedure is repeated. The test is positive if the diluted sample supports combustion above the water surface.

Method numbers are shown without suffix. The latest promulgated methods will be used.

SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update.
ASTM refers to *Annual Book of ASTM Standards*, ASTM International.

TABLE 4-3
SUMMARY OF PERMIT COMPLIANCE ANALYTICAL PARAMETERS, RATIONALE, AND TEST METHODS

| PARAMETER | RATIONALE & FREQUENCY | METHODS | USES |
|---|---|---|---|
| Arsenic, Beryllium, Cadmium, Chromium, Lead | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method 3050 (acid digestion)<br>SW-846 Method 6010 (ICP) | Calculation of constituent feed rate; comparison to permit limit. |
| Mercury | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method 3050 (acid digestion)<br>SW-846 Method 7471 (CVAAS) | Calculation of constituent feed rate; comparison to permit limit. |
| Sulfur (1) | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-day composite. Analysis of each composite to form 12-month rolling average. | EPA Method 5050/9056A | Comparison to maximum permitted sulfur loading on spent carbon. |
| Total chlorine | Demonstrate compliance with RF-2 constituent feed rate limits. Four daily samples combined and sub-sampled into ~15 to 20-day composite. Analysis of each composite to form 12-month rolling average. | SW-846 Method 5050 (bomb combustion)<br>SW-846 Method 9252A | Calculation of constituent feed rate; comparison to permit limit. |

Notes;

(1) See Appendix D for Standard Operating Procedure for Sulfur as Sulfate

Method numbers are shown without suffix. The latest promulgated methods will be used.

SW-846 refers to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* USEPA, latest update.

# 5.0 PROCEDURES USED TO OBTAIN A REPRESENTATIVE SAMPLE OF SPENT CARBON

Sampling of spent carbon will be employed as part of the on-site screening process and permit compliance as described below.

## 5.1 BULK LOADS

A representative sample of each bulk load will be obtained using either a shovel or scoop. The sampling instrument will be rinsed with water after every sampling event. The sample from each bulk shipment will be taken to the laboratory for screening analyses.

## 5.2 CONTAINERS

Each container will be opened for the purpose of inspection and sampling. The lid or top on each container will be left loosely in place unless sampling or inspection of the container is actually occurring. A Material Handler or another designated employee will obtain one sample from each randomly selected container using the following selection strategy.

1. The number of containers chosen for random selection from each spent carbon generator will equal the square root plus one of the total shipped by the generator in each load. Thus, if a generator shipped one container, that container would be sampled. If a generator shipped sixteen containers, five would be sampled. If the square root is not an integer, it will be rounded to the next highest number. The waste tally sheet and EWT internal labels are generated by computer and perform the random sampling calculations. Printed tally sheets and labels designate which containers are to be sampled.

2. If any container contains a spent carbon which either is visually different from the profiled spent carbon, or a composite of the individual samples fails the on-site screening process described in Section 4, each container from that spent carbon generator may be sampled and subjected to the on-site screening analyses listed in Table 4-2.

Each representative sample will be obtained using the appropriate adaptation of the general methodology listed in ASTM Standard D346. The sample will be placed in clean sample jars, covered with an appropriate lid, and immediately taken to the facility laboratory for analysis. A label will be placed on each jar, indicating the profile number and the date of the sample. After sampling, the lid will be replaced on each container and it will be sealed if it is going to be stored. A composite sample will be analyzed from each load of spent carbon received from each generator. The composite sample will be prepared by combining equal amounts of carbon from each grab sample that was collected from the randomly selected containers in the load.

## 5.3 CARBON FEED

Four times daily, the access cover of the weigh belt will be opened for the purpose of sampling. An operator or another designated employee will obtain one grab sample of the feed carbon, and place the sample into a clean sample jar.

At the end of each day, the four grab samples will be stored in the on-site laboratory.

At the end of each approximately 15 to 20 day period, the daily feed samples will be opened and an equal amount will be removed from each jar and placed into a clean sample jar, to form a carbon feed composite sample.

A label will be placed on the composite sample jar, indicating the date range of the sample, and the sample will be sent to an off-site laboratory for the analyses listed in Table 4-3.

## 5.4 MAINTAINING AND DECONTAMINATING SAMPLING EQUIPMENT

Equipment used to obtain representative samples will be inspected as per the facility's inspection schedule to ensure it is in proper working order. Sampling equipment will be decontaminated by rinsing with water after each sampling event.

## 5.5 SAMPLING QA/QC PROCEDURES

Sampling equipment is decontaminated between sampling events or is disposed of to minimize the possibility of cross contamination. The equipment is decontaminated using a method appropriate to the type of material sampled. For example, scoops are generally rinsed with water to remove solids. New sampling equipment that is known to be clean will not be decontaminated prior to use.

## 6.0 METHODS TO ENSURE COMPATIBILITY WITH HANDLING METHODS

The spent carbon testing procedures outlined in this Waste Analysis Plan have been developed with cognizance of the spent carbon storage and handling procedures at the Parker facility. The facility is designed to safely store, transfer and reactivate spent carbon, which is contaminated with wastes that are toxic and/or ignitable. The Parker facility takes the necessary precautions to prevent the accidental ignition of ignitable spent carbon. As shown in Table 4-1, the facility pre-acceptance procedures include compatibility testing to identify materials that have the potential to be incompatible. The facility will not receive spent carbon which is characterized by the generator as reactive or corrosive, or spent carbon identified by waste codes which are not authorized for receipt at the facility.

## 7.0 METHODS TO ENSURE WASTE ANALYSIS PLAN IS KEPT UP-TO-DATE

The Plant Manager, Environmental Health and Safety Specialist or another designated person shall review the Waste Analysis Plan at least every two calendar years to determine if it is in compliance with current RCRA regulations and otherwise meets the needs of the facility. A statement that the plan was reviewed will be maintained in the permanent files at the facility.

If the WAP is revised as a result of the review process, a copy of the revised document will be provided to EPA.

## 8.0 LAND DISPOSAL RESTRICTION NOTIFICATION FORMS

Generators of spent carbon that is restricted from land disposal pursuant to 40 CFR 268 will be required to provide appropriate documentation.

At the time of spent carbon receipt, EWT will receive and review the forms, which must accompany the first shipment of spent carbon that is subject to land ban restrictions. EWT will file the completed forms with the Treatment Storage and Disposal copy of the hazardous waste manifest as part of the facility operating record.

# 9.0 SPECIAL PROCEDURAL REQUIREMENTS

This section provides discussion on special procedural requirements applicable to the facility. These include 40 CFR 264 Subpart BB and Subpart CC applicability.

## 9.1 Subpart BB

The facility Subpart BB Compliance Plan is located in Appendix XIX of the Part B Permit

## 9.2 Subpart CC

The Subpart CC Compliance Plan is located in Appendix XVI of the Part B Permit

## 9.3 Wastes Generated On-Site

EWT generates several regulated waste streams as part of its operations. These include debris, filter cake from the wastewater treatment operations, used personnel protective equipment, and spent activated carbon used for tank vent control in compliance with Subpart CC and FF. Of these wastes, all are manifested and sent off site for disposal, with the exception of the spent activated carbon used for tank vent control. This spent activated carbon is similar to the spent carbon received at the EWT facility, as it is derived from the treatment and storage of those carbon streams and is treated by EWT in the same manner as the spent carbon received from off-site.

# WASTE ANALYSIS PLAN

# APPENDIX A

# WASTE PROFILE FORMS

Revision 4
October 2019

## PROFILE INSTRUCTIONS

**1.** ***Generator information*** The generator of the spent carbon must provide all requested contact information. Completely fill in the mailing address of the generator of the spent carbon. The mailing address is where the manifest will be mailed and must match the manifest mailing address. Completely fill in the name of person responsible for completing the Profile Form and who can be contacted with questions concerning the Profile Form and/or shipment(s). The Site EPA Identification Number must be included if the spent carbon is hazardous.

**2.** ***Consultant information*** If a consultant or subcontractor is providing the profile information on behalf of the generator, the consultant information must be filled out entirely. Completely fill in the street address of the site location of the spent carbon if it is different from 1(a). The address must match the information for the EPA ID Number. If generator, site and/or consultant are the same, please indicate "same". If none, please state "none or n/a".

**3.** ***Properties and Composition of the Spent Carbon*** In addition to a specific description of the process generating the spent carbon enter the specific constituents on the carbon. Please be specific when entering the data in this field, see the examples below.

*Example of unacceptable description of constituents:* VOC's from soil vapor extraction, halogenated hydrocarbons, and other VOC's, etc.

*Example of acceptable description of constituents:* Groundwater remediation to remove benzene or BTEX from a LUST, groundwater remediation for tetrachloroethylene in the vicinity of a dry cleaner, etc. Please list the source of the contamination if known.

**4.** ***Existing Profile Number*** If there is an existing profile number for the spent carbon include the previous approved profile number and expiration date in this section.

**5.** ***Type of Spent Carbon*** Select the applicable carbon type vapor or aqua phased.

**6.** ***Foreign Material*** If the carbon contains any foreign materials such as dirt, rocks or other foreign materials, a representative sample must be sent to the Parker facility at the Arizona physical address for evaluation. A one pound sample is adequate. If nothing is present, please check off "no."

**7.** ***Handling*** Indicate the container in which the carbon will be shipped. Note: containers containing hazardous materials must meet general packaging requirements DOT 49 CFR 173.24. (a)(b).

**8.** ***Free Liquid Range*** An estimated range of free liquid accompanying the spent carbon must be selected.

**9.** ***Liquid Flashpoint*** If the flashpoint range of the free liquid has not yet been determined, please send a sample to SWT for analysis.

**10.** ***pH Range*** If the pH has not yet been determined, please send a sample to the SWT for analysis.

**11.** ***Strong Odor*** If the carbon contains a strong odor a sample must be sent to the Parker facility at the Arizona physical address for evaluation. A one pound sample is adequate.

**12.** ***Superfund Site*** If the spent carbon is from a Superfund site please check the "yes" box. A Superfund site is identified by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or the Superfund Amendments and Reauthorization Act of 1986 (SARA).

**13.** ***Benzene NESHAP*** If the spent carbon comes from a process meeting the requirements of 40 CFR 61.341, please check the "yes" box. The BWON Addendum must be completed and attached to the Profile Form. Total benzene analysis is required on BWON waste streams.

**14.** ***Carbon Containing the Following*** If the spent carbon contains any contaminants listed in items A-I on the Profile Form please check the appropriate box "yes".

Revised October 2014

- **A.** If the spent carbon contains PCBs the Addendum for Non-Regulated PCB Waste must be completed and attached to the Profile Form. Please note the required analysis for each shipment.
- **B.** Dioxins and/or furans will not be accepted at either the Parker or Red Bluff facility.
- **C.** If the spent carbon contains DBCP additional analysis and a review will be required before the profile can be approved.
- **D.** Sulfide or Cyanide will not be accepted at either the Parker or Red Bluff facility.
- **E.** Explosives, pyrophoric or radioactive material will not be accepted at either the Parker or Red Bluff facility.
- **F.** Infectious materials will not be accepted at either the Parker or Red Bluff facility.
- **G.** Shock sensitive material will not be accepted at either the Parker or Red Bluff facility.
- **H.** Oxidizers will not be accepted at either the Parker or Red Bluff facility.
- **I.** Heavy metals must to be identified and totals, not TCLP, metals analysis must be conducted and attached to the Profile Form.

**15.** ***Generator Classification*** Indicate if the spent carbon is considered a hazardous waste under federal RCRA regulations. List all applicable waste codes. (Please see 40 CFR Part 261.31- 261.33 for listed waste codes and 40 CFR Part 261.21 – 261.24 for characteristic waste codes). The federal EPA and many states provide that a spent carbon may be classified as "sludge" when generated from an air pollution control facility municipal, commercial, or industrial wastewater treatment plant or a water supply treatment plant and the spent carbon contains no listed hazardous waste. To qualify for this exemption, the spent carbon must be returned to a reactivation facility where the spent carbon is reclaimed and the spent carbon must be generated in a state whose regulations provide for the classification of such spent carbon as a "sludge." If the spent carbon meets the requirements of 40 CFR 261.2(c)(3)) and the state where it is generated, an Addendum for Sludge Exemption must be completed and submitted with the Profile Form. Note: It is the generator's responsibility to classify the spent carbon.

**16.** ***Generator Classification*** Indicate if the spent carbon is considered a hazardous waste under regulations of the state in which it is generated. If so, list all applicable state waste codes. Note: It is the generator's responsibility to classify the spent carbon.

**17.** ***Land disposal restriction notification*** The USEPA Hazardous Waste Land Disposal Restrictions require that every generator of restricted hazardous waste send a notification that describes the waste and its status under the Land Ban regulations. 40 CFR 268.

**18.** ***Estimated annual carbon usage*** Indicate an estimate of the annual carbon usage, in pounds per year, for the specific profile.

### *ANALYTICAL REQUIREMENTS*

Analytical data on the spent carbon are required with each new Profile Form and with each renewal Profile Form even if the waste stream has not changed. Spent carbon should be analyzed for the constituents being treated in the waste stream. Analysis must have been performed within the last six (6) months by a state-certified laboratory, such as the Evoqua Water Technologies laboratory.

***RCRA Profiles only***
RCRA hazardous profiles require additional testing; "11 RCRA Tests". A one-pint sample of the spent carbon must be submitted to Evoqua Water Technologies,. Attn: Lab, 5375 S. Boyle Ave., Los Angeles, CA 90058. It is recommended the "11 RCRA Tests" be performed at by the EWT lab in Vernon, CA because internal test methods are required. A completed and signed LDR is required to be submitted prior to profile approval.

***PROFILE APPROVAL***
Submit the completed electronic Profile Form and all required Addenda via email to your Evoqua Sales representative along with spent carbon samples for testing. Notification of approval will be forwarded to the consultant (if listed) or the generator via email. Upon receipt of your profile approval letter, contact your EWT Sales Representative to schedule service and transportation.

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## SPENT CARBON PROFILE FORM

**GENERATOR INFORMATION**

1. a) Generator: ______________________ b) Site: ______________________
Address: ______________________
Mailing Address: ______________________ ______________________
(Manifest Return) ______________________ ______________________
______________________
c) Contact Name: ______________________ d) EPA ID#: ______________________
e) Phone No: ______________________ f) Fax No: ______________________

**CONSULTANT INFORMATION**

2. a) Consultant: ______________________ b) Contact: ______________________
Mailing Address: ______________________ c) Phone: ______________________
______________________ d) Fax: ______________________
______________________ e) Email: ______________________

**PROPERTIES AND COMPOSITION OF THE SPENT CARBON**

3. Provide a specific description of the process generating the spent carbon <u>including constituents</u> being treated. *(Please note if application is for potable water or food processing)*

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

4. If this is a Renewal, Provide the Existing Profile Approval Number: ______________________

5. Type of Spent Carbon: ☐ Aqueous ☐ Vapor

6. Foreign Material: ☐ Yes ☐ No (rocks, dirt, sand, etc.)

7. Handling: ☐ Bulk ☐ Drum ☐ Adsorber ☐ Bulk Bag ☐ Other ______________

8. Free Liquid Range: ☐ 0 ☐ 1 – 15%

9. Liquid Flashpoint: ☐< 140°F ☐ >140°F ☐ N/A Vapor

10. pH Range: ☐ <2 ☐ 2-4 ☐ 4.1-10.5 ☐ >10.5

11. Strong Odor? ☐ Yes ☐ No If yes, please Describe______________________

12. Is spent carbon generated from a Superfund Site? ☐ Yes ☐ No

13. Is the Spent Carbon generated from any activity at a chemical manufacturing plant, petroleum refinery or coke by-product recovery plant, i.e., a facility subject to Subpart FF (the Benzene Waste NESHAP)? *If yes, complete BWON Addendum*. ☐ Yes ☐ No

14. Is the Spent Carbon generated from any activity at an ethylene manufacturing process unit subject to 40 CFR Part 63, Subpart XX (Ethylene MACT)? *If yes, complete the Ethylene MACT Addendum* ☐ Yes ☐ No

15. Does the spent carbon contain any of the following?

| | | |
|---|---|---|
| A. Polychlorinated Biphenyls (PCBs) | ☐ Yes | ☐ No |
| B. Dioxins and/or Furans | ☐ Yes | ☐ No |
| C. Dibromochloropropane (DBCP) | ☐ Yes | ☐ No |
| D. Sulfide or Cyanide | ☐ Yes | ☐ No |
| E. Explosive, Pyrophoric and/or Radioactive material | ☐ Yes | ☐ No |
| F. Infectious material | ☐ Yes | ☐ No |
| G. Shock Sensitive material | ☐ Yes | ☐ No |
| H. Oxidizer | ☐ Yes | ☐ No |
| I. Heavy Metals | ☐ Yes | ☐ No |

**GENERATOR CLASSIFICATION**

16. Is the Spent Carbon a **RCRA** Hazardous Waste? ☐ Yes ☐ No
If yes, list waste code(s) below:
*RCRA Hazardous Waste requires "11 RCRA" Analysis*

__________ __________ __________ __________

__________ __________ __________ __________

17. Is the Spent Carbon a **State** Hazardous Waste? ☐ Yes ☐ No
If yes, list waste code(s) below:

__________ __________ __________ __________

**GENERATOR CERTIFICATION**

**I hereby certify that all information on this and all attached documents are true and that this information accurately describes the subject spent carbon. I further certify that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR 261 Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize Evoqua Water Technologies LLC to obtain a sample from any waste shipment for purposes of confirmation or further investigation. If I am a consultant signing on behalf of the generator, I have their proper approval.**

____________________ ____________________
**Printed Name** **Signature**

____________________ ____________________
**Title** **Date**

**NOTE**: A completed and signed LDR must be submitted prior to profile approval for RCRA-regulated spent carbon.

*For Internal Use Only*
:

________________ ________________
Profile Approval Number Valid Through

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR SLUDGE EXEMPTION

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

The following information must be provided before approval of the profile if the generator requests that the spent carbon be classified as a non-hazardous sludge for reclamation in accordance with 40 CFR 261.2.

**1**. Is the subject spent carbon a sludge, as defined at 40 CFR 260.10?
☐**Yes** ☐**No**

**2**. Was the subject spent carbon generated from a municipal, commercial, or industrial wastewater treatment plant or water supply treatment plant or air pollution control facility?
☐**Yes** ☐**No**

**3**. Is the subject spent carbon a RCRA listed waste?
☐**Yes** ☐**No**

**4**. Was the subject spent carbon ever placed in contact with, or used to treat, a RCRA **listed** waste?
☐**Yes** ☐**No**

**5.** Was the subject spent carbon generated by a RCRA regulated treatment, storage or disposal facility?
☐**Yes** ☐**No**

**6.** If question 5 is checked YES, does it “contain” or is it “derived from” a RCRA listed waste?
☐**Yes** ☐**No**

**7.** Is the subject spent carbon exempt from hazardous waste regulation in the state of generation?
☐**Yes** ☐**No**

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form. I further certify that the subject spent carbon is exempt from regulation as a hazardous waste.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

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(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263
**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## PROFILE ADDENDUM LISTED WASTE APPLICABILITY

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

**1.** Does the spent carbon contain constituents from a pure product release or tank vent?

☐**Yes** ☐**No** ☐ **Unknown ****

**2.** Is the spent carbon from a cleanup of PCE, TCE or other spent solvents from a dry cleaner or from degreasing or other cleaning operations?

☐**Yes** ☐**No** ☐ **Unknown ****

**3.** Is the original process generating the waste an F, K, P or U-listed process?

☐**Yes** ☐**No** ☐ **Unknown ****

** Check the "Unknown" box if this material is generated from remediation activities and the historical processes have not been determined.

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR BENZENE WASTE OPERATIONS NESHAP (BWON)
## 40 CFR PART 61, SUBPART FF

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** _______________

**1.** Is the Spent Carbon generated from any activity at a chemical manufacturing plant, petroleum refinery or coke by-product recovery plant, i.e., a facility subject to Subpart FF (the Benzene Waste NESHAP)?

☐**Yes** ☐**No**

**2.** If Yes, does the spent carbon contain any benzene?

☐**Yes** ☐**No**

**If Yes, the Generator must provide analytical data for total benzene concentration that is representative of the waste stream, consistent with 40 CFR § 61.355.**

**3.** If Yes, does the Spent Carbon contain benzene which is required to be managed and treated in accordance with the provisions of Subpart FF?

☐**Yes** ☐**No**

**If Yes, the Generator agrees that it will:**

(i) send a notice with each shipment of Spent Carbon that is subject to Subpart FF stating that the shipment contains benzene and must be managed and treated in accordance with Subpart FF [40 CFR § 61.342(f)(2)]; and

(ii) Prior to each shipment, test each container of Spent Carbon subject to Subpart FF test requirements to confirm no detectable emissions using EPA Method 21 upon initial use of the container [40CFR § 61.345(a)(1)(i)].

In addition to certification on the attached Spent Carbon Profile Form, I further certify that all information on this Addendum is true and accurate, and that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR § 61.355.

______________________________ ______________________________

**Printed Name** **Signature**

______________________________ ______________________________

**Title** **Date**

Reset Form Print Form

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(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263
**California Facility:** 11711 Reading Road • Red Bluff, CA 96080
(530) 527-2664 • FAX (530) 527-0544 EPA ID: CAR 000 058 784

## PROFILE ADDENDUM FOR NON-REGULATED PCB WASTE

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

**1.** Does the subject spent carbon contain < 50 ppm PCBs?

☐**Yes** ☐**No**

**2.** Does the influent from the subject spent carbon contain < 50 ppm PCBs?

☐**Yes** ☐**No**

**3.** Is the subject spent carbon regulated under 40 CFR Part 761?

☐**Yes** ☐**No**

I certify that the information on this form is true and accurately describes the subject spent carbon on the attached spent carbon profile form. I further certify that any PCBs (Polychlorinated Biphenyls) on the carbon is non-regulated under 40 CFR Part 761 (non TSCA regulated). I will submit PCB analytical results of the carbon prior to each shipment.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Reset Form Print Form

# Evoqua Water Technologies LLC

**Arizona Facility**: 2523 Mutahar Street • P.O. Box 3308 • Parker, AZ 85344
(928) 669-5758 • FAX (928) 669-5775 EPA ID: AZD 982 441 263

## PROFILE ADDENDUM FOR ETHYLENE MANUFACTURING PROCESS UNIT WASTES MACT 40 CFR PART 63, SUBPART XX

**Generator:** ______________________________

**Site Address**: ______________________________ **City/State:** ____________________

**1.** Is the Spent Carbon generated from any activity at an ethylene manufacturing process unit subject to 40 CFR Part 63, Subpart XX (the Ethylene MACT)?

☐ **Yes** ☐ **No**

**2.** If Yes to Q. 1, does the spent carbon contain any benzene which is required to be managed and treated in accordance with the provisions of the Ethylene MACT?

☐ **Yes** ☐ **No**

**3.** A. If Yes to Q. 1, does the spent carbon contain any 1,3-butadiene which is required to be managed and treated in accordance with the provisions of the Ethylene MACT?

☐ **Yes** ☐ **No**

B. For carbon that contains any 1,3-butadiene, was the carbon used to manage and/or treat a continuous butadiene waste stream that contained greater than or equal to 10 ppmw 1,3-butadiene and with a flow rate greater than or equal to 0.02 liters/minute?

☐ **Yes** ☐ **No**

**If Yes, the Generator agrees that it will:**

(i) send a notice with each shipment of spent carbon that is subject to the Ethylene MACT stating that the shipment contains organic HAPs that are required to be treated in accordance with the Ethylene MACT, 40 CFR Part 63, Subpart XX; and

(ii) Prior to each shipment, test each container of spent carbon subject to the Ethylene MACT test requirements to confirm no detectable emissions using EPA Method 21 upon initial use of the container [40CFR § 61.345(a)(1)(i)].

In addition to certification on the attached Spent Carbon Profile Form, I further certify that all information on this Addendum is true and accurate, and that all samples and analyses submitted are representative of the subject spent carbon in accordance with the procedures established in 40 CFR §§ 63.1095 and 61.355.

______________________________ ______________________________
**Printed Name** **Signature**

______________________________ ______________________________
**Title** **Date**

Revised Janaury 2014

# WASTE ANALYSIS PLAN

# APPENDIX B

# EXAMPLE SPENT CARBON TALLY SHEET

Revision 4
October 2019

# Incoming Spent Carbon Waste Tally and On-site Screening Report

CC

| Generator Name | | | Approval # |
|---|---|---|---|
| SAMPLE WASTE TALLY | | | W120000RH |
| **Container Type** | **Quantity** | **Manifest #** | **Samples** |
| Bag | 5 | 123456 | |

On-site Screening Report

Results taken from  containers were:

| Ignitable Solid | | Compatable | | Composite PH (4.1 to 10.5) |
|---|---|---|---|---|
| **Yes** | **No** | **Yes** | **No** | |
| **On-Site Screening Completed By (Sign Below)** | | | | **Date** |
| | | | | |

| Container | % Full | * Sealed? (see note below) | Material | Sample |
|---|---|---|---|---|
| **1** | | | | ☑ |
| **2** | | | | ☑ |
| **3** | | | | ☑ |
| **4** | | | | ☑ |
| **5** | | | | ☐ |

*** For FF and CC Containers a check under Sealed, shall mean a visual inspection of the container has been completed and there are no visible cracks, holes, gaps or other open spaces into the interior of the container when the cover and closure device is secured in the closed position. If the inspection is unsatisfactory, the containers will either be overpacked or transferred to the spent carbon storage tank within the first 24 hours of receipt.**

# WASTE ANALYSIS PLAN

# APPENDIX C

# ON-SITE SCREENING PROCEDURES

Revision 4
October 2019

Evoqua Water Technologies

# Standard Methods for Screening Incoming Spent Carbon

## Scope and Application

Evoqua Water Technologies (EWT) will screen all incoming RCRA hazardous spent carbon to assure that the parameters in the fingerprint tests corresponds to the approved profile.

## Safety and Waste Handling

Procedures shall be carried out in a manner that protects the health and safety of all Siemens employees. When handling samples safety glasses and appropriate gloves must be worn. Gloves that have been contaminated will be removed and discarded. Exposure to chemicals must be maintained as low as reasonably achievable, therefore all samples must be opened and prepared in a fume hood. Waste containers will be kept closed unless transfers are being made.

Since the ignitability test requires the use of an open flame, keep the area clear of all other flammable materials.

All work must be stopped in the event of a known or potential compromise to the health and safety of Siemens employees.

## Summary of Methods

Fingerprinting tests include; physical inspection, ignitability, pH and compatibility of RCRA hazardous incoming spent carbon.

## Procedures

### Physical Inspection

Samples are visually inspected for the presence of material other than carbon such as rocks, debris, etc. Technician will determine if the carbon is aqua phase or vapor phase and document findings on the waste tally sheet.

## pH Test

In a beaker add a volume of deionized water that is equal to that of the carbon. Stir and let it stand for five seconds. Measure the pH using pH test strips. The color change is compared to the chart on the box and the value is documented on the waste tally sheet for review by plant management. If the pH is <3 or > 11, or outside the pH range of the profile notify your supervisor.

## Compatibility Test

After taking the pH of the carbon sample let the mixture stand for one minute and observe for reaction such as smoke, vapors or for an exothermal reaction. Results of this test are documented on the waste tally sheet for review by plant management. If any reaction occurs notify your supervisor.

## Ignitability Test

Check the ignitability of carbon by using a multi-purpose lighter and applying a flame directly to the carbon for 5 seconds. If the carbon burns and continues to sustain a flame it may be considered ignitable. If this occurs, mix the sample 50/50 with deionized water and reapply a flame for 5 seconds. If the liquid sustains a flame, the carbon will be deemed ignitable. Results of this test our documented on the waste tally sheet for review by plant management.

## Documentation and Record Keeping

Results are recorded on a waste tally sheet and signed by the technician performing the procedures. Plant management reviews results to determine if carbon is acceptable to be received into the plant.

# WASTE ANALYSIS PLAN

# APPENDIX D

# STANDARD OPERATING PROCEDURE FOR SULFUR AS SULFATE

Revision 4
October 2019

# Evoqua Water Technologies

## Standard Operating Procedure for Sulfur EPA Method 375.4 from an Oxygen Bomb Combustate Solution from EPA 5050

---

### 1.0 Scope and Application

1.1 This method is primarily intended for use in determining sulfate present in granular activated carbon by burning a sample in an oxygen bomb calorimeter in the presence of oxygen. The sample is oxidized by combustion and collected in a sodium carbonate/sodium bicarbonate solution. The solution is then analyzed for sulfate and inferred from that measurement the amount of sulfur present. From the assay of a stoichiometric relationship of two compounds it can be determined between what is measured and what is sought.

### 2.0 Summary of Method

2.1 Inorganic and organically-bound sulfur may be determined in a sample by conversion of all Sulfur to the $SO_4^{2-}$ ion. This step is accomplished by ignition of the sample in oxygen in an Oxygen Bomb Calorimeter closed system.

2.2 Once the conversion of sulfur to sulfate has been accomplished, the sulfate can be measured by reacting it with barium within a Hach SulfaVer 4 Reagent. The reaction forms a turbid sample of barium sulfate. The amount of turbidity formed is proportional to the sulfate concentration and measured by a spectrophotometer at a wavelength of 450 nm and compared to a curve prepared from standard sulfate solutions. The most common precipitant for sulfate is the barium ion. The reaction is:

$$Ba^{2+} + SO_4^{2-} = BaSO_4\ (s)$$

2.3 The amount of sulfur present is reported in (mg/kg of Sulfur). The amount of sulfur present is inferred from the amount of Sulfate. The BaSO4 is measured and written as w/w to indicate that this is by weight of the solid one material and infer from that measurement the amount of another material. There is a 1:1 stoichiometric relationship between $SO_4^{2}$ and $BaSO_4$ for reporting (w/w) $SO_4^{2-}$.

2.4 This method is capable of measuring sulfate at 1.0 mg/L as $SO_4^{2-}$
If a result is obtained less than the Minimum Detection Limit (MDL) (5.0 mg/L) the result is reported as less than the detection limit (ND)

If the measurement falls the outside the calibration curve dilution factors corrections are introduced in the final calculations.

3.0 Equipment

3.1 Spectrophotometer Hach DR4000 for use at 450nm with light path of 4 to 5 cm.

4.0 Reagents and Standards

4.1 Sulfa Ver 4 Reagent Powder Pillows Hach Cat # 12065-99

4.2 Sulfate Standard Solution 2500 mg/L, Hach Cat # 2578-49

4.3 Water Di Ionized

4.4 Sodium carbonate

4.5 Sodium bicarbonate

4.6 A 2500 mg/L sulfate standard solution is commercially bought from HACH in the test procedure. The stock standard solution is standardized using a seven-point calibration standard curve and the HACH DR 4000 method program is calibrated on program number 375.4.

5.0 Interferences

5.1 Color and suspended matter interfere with the photometric measurement. To counter this positive interference, a sample blank, from which barium chloride has been omitted is run as a blank.

5.2 Silica in concentrations over 500 mg/L will also interfere. Granular activated carbon does have concentrations above this level.

5.3 If suspended matter and turbidity of the sample occurs after the bomb preparation, samples are pre-filtered prior to analysis. To ensure all positive interferences are removed prior to analysis a sample blank untreated is run with each batch of samples to counter this potential positive interference.

## 6.0 Procedure

6.1 Sample Preparation: prepare the sample in an oxygen bomb calorimeter as in EPA Method 5050 Bomb Preparation Method for Solid Samples reference footnote 9.1 & 9.2.

Note: Carbon samples are pulverized to 60 mesh. Particle size is important because it influences the reaction rate. In addition, high moisture samples (greater than 25%) or completely dry samples may not combust readily on their own. The addition of benzoic acid to facilitate complete combustion is added to the samples to ensure complete combustion. Most carbon samples burn well in the as-received condition.

Oxidation of sulfur oxides: The oxygen bomb calorimeter operates at a temperature and atmospheric pressure high enough to inhibit the association of sulfur oxides. If complete combustion occurs, none should exist above 1000 C. In calorimetric determinations on carbon the maximum temperature reached is well above 1000 C so that no sulfur oxides should exist. It is possible for the oxides to occur if the bomb is not completely combusted or the cooling down is done too rapidly after combustion. If complete combustion does not occur and residual soot is found in the bottom of the bomb the sample is re- combusted. To ensure no formation of sulfur oxides occur after the bomb completion, the bomb gasses are very slowly released into a bubbled reservoir of de-ionized water. 10 ml of a buffer solution of sodium carbonate/sodium bicarbonate solution is placed in the bottom of the bomb to neutralize the acids that may form during combustions.

Certified reference material standards of ultra low and high sulfur concentrations are run
and combusted in the same procedure as the samples received for testing.

6.2 Sample testing: follow the procedure as outlined in HACH Sulfate USEPA Sulfaver 4 Method equivalent to USEPA equivalent 375.4 for wastewater.

## 7.0 Calculations

mg/kg of Sulfur: = (AXBXC)/D

Where:
A = mg/L of sulfate (reading from calibration curve)
B = final volume of extract (0.1 liter)
C = Sulfur / Sulfate mole Ratio (32066/96060), 0.3338 D =
weight of sample (kg)

## 8.0 Quality Control

### 8.1 Quality Control for an entire batch (up to 20) samples will include:

- LB, Laboratory blank control sample without barium chloride

- LCS, Laboratory control sample of sulfate. A known certified sample of sulfate purchased commercially from HACH, which is carried through the preparation and analysis procedures as if it were a sample. Laboratory control sample of sulfur, certified: A certified reference standard with a certificate of analysis from a commercial outside source of sulfur standard.

- MS, Spiked sample, an interference free matrix spiked sample with a known concentration of the sulfate.

- MSD, Matrix Spike Duplicate run under same conditions as spiked sample

## 9.0 Reference

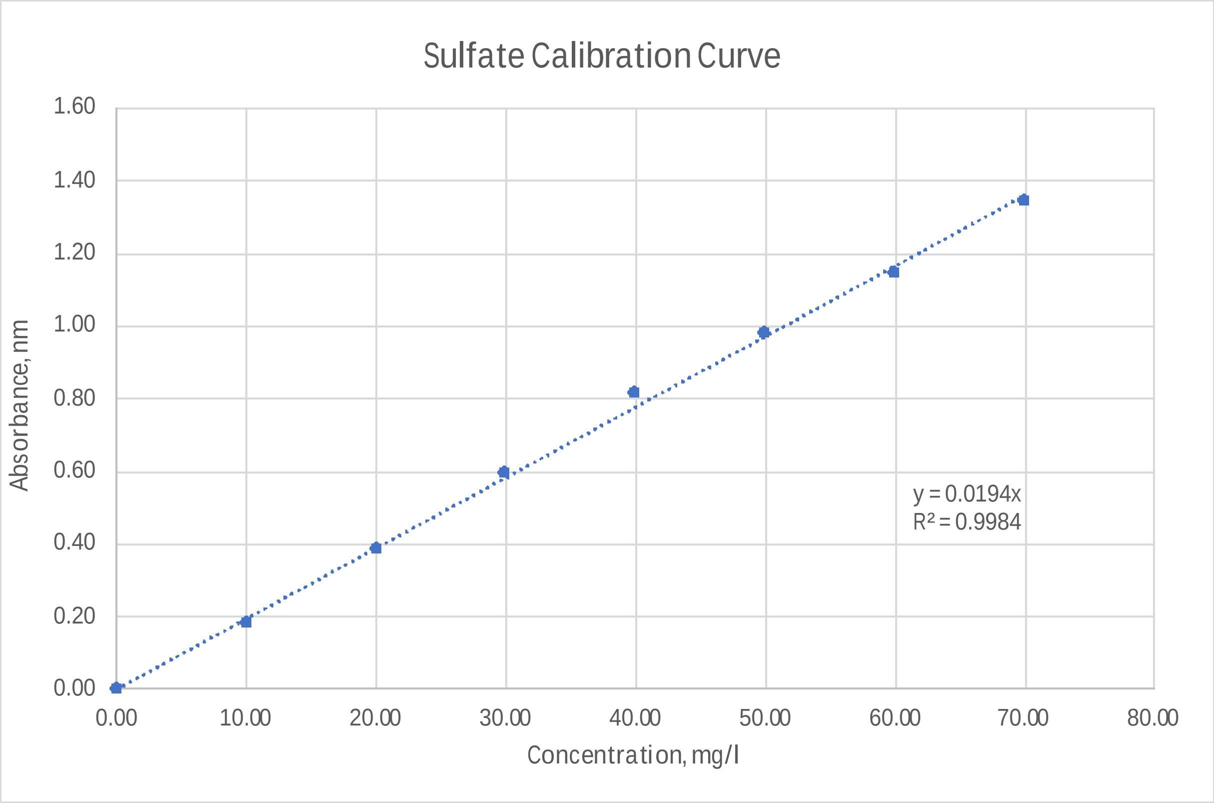
9.1 Parr Oxygen Bomb Calorimeter Operating Instructions.: Instruction manual 6200 from Parr Instrument Company, lot # 032019_3

9.2 EPA Method 5050 Bomb Preparation Method for Solid waste. Revision 0 September 1994

9.3 EPA Method SulfaVer 4 Method, Sulfate USEPA Method 375.4 for sulfate in wastewater.

9.4 Sulfate USEPA SulfaVer4 method 2, HACH Doc 316.53.01135

# Analytical Calibration for Sulfate




**Certified Sulfate Standard**

**Hach 14252-10** Lot Number: A2249

**Certified Concentration: 2500 mg/l**

| Concentration mg/l | Absorbance nm |
|---|---|
| 0.00 | 0.000 |
| 10.00 | 0.184 |
| 20.00 | 0.383 |
| 30.00 | 0.595 |
| 40.00 | 0.817 |
| 50.00 | 0.982 |
| 60.00 | 1.146 |
| 70.00 | 1.346 |

# Certified Sulfur Reference Standard Data

**Certified Reference Standard #1**

**AR-1684** Lot Number: 684616 LID ID Number: 684616

**Certified Weight Percent Sulfur = 0.098%**

Expanded Uncertanty = 0.012

| | Replicates | | | | | | | Av. Tested | Expanded |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wt% | Uncertanty |
| Absorbance | 0.180 | 0.165 | 0.225 | 0.231 | 0.194 | 0.201 | 0.186 | | |
| Concentration | 9.28 | 8.51 | 11.60 | 11.91 | 10.00 | 10.36 | 9.59 | 10.18 | 0.95 |
| Sample Wt. (g) | 0.3494 | 0.3360 | 0.3711 | 0.3718 | 0.3498 | 0.3367 | 0.3285 | | |
| mg/kg sulfate | 2655.5 | 2531.3 | 3125.3 | 3202.6 | 2858.8 | 3077.2 | 2918.6 | | |
| Weight Percent Sulfur | 0.089 | 0.084 | 0.104 | 0.107 | 0.095 | 0.103 | 0.097 | 0.097 | 0.0065 |

## Certified Reference Standard #2

**AR-1700** **Lot Number: 700219** LID ID Number: 700219

**Certified Weight Percent Sulfur = 0.36%**

Expanded Uncertanty = ± 0.01

| | Replicates | | | | | | | Av. Tested | Expanded |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wt% | Uncertanty |
| Absorbance | 0.765 | 0.780 | 0.695 | 0.795 | 0.740 | 0.735 | 0.680 | | |
| Concentration | 39.43 | 40.21 | 35.82 | 40.98 | 38.14 | 37.89 | 35.05 | 38.218 | 1.7042 |
| Sample Wt. (g) | 0.3681 | 0.3710 | 0.3495 | 0.3705 | 0.3564 | 0.3617 | 0.3428 | | |
| mg/kg sulfate | 10712.6 | 10837.2 | 10250.3 | 11060.6 | 10702.7 | 10474.6 | 10225.1 | | |
| Weight Percent Sulfur | 0.358 | 0.362 | 0.342 | 0.369 | 0.357 | 0.350 | 0.341 | 0.354 | 0.0084 |

# Laboratory Control Standard(LCS)

| Sample ID | Date Sampled | Date Prepared | Date Tested | LC( mg/L) | LT (mg/L) | C (mg/L) | S (mg/L) | B (mg/L) | R % |
|---|---|---|---|---|---|---|---|---|---|
| 33464 | 9/12/2019 | 9/19/2019 | 9/19/2019 | 18.48 | 16.30 | | | | 113 |

## Laboratory Control Sample

A Laboratory Control Standard (LCS) is a blank that is spiked with a known amount of analyte and is used to measure the accuracy in the absence of matrix interference. The LCS is prepared at a concentration greater than 5 times the reporting detection limit.

The % LCS recovery is calculated as follows:

$$R = (LC/LT) \times 100$$

where,

R = % LCS recovery
LC = measured LCS concentration (mg/L)
LT = theoretical LCS concentration (mg/L)
= C x (S/B)
C = concentration of standard used to spike LCS (mg/L)
S = amount of spike added to LCS
B = total amount of LCS used

## Laboratory Matrix Spike

| Date Sampled | Date Prepared | Date Tested | Spike Level (T) | Result (S) | % Recovery ® | % Rec Limit |
|---|---|---|---|---|---|---|
| 9/12/2019 | 9/19/2019 | 9/19/2019 | 16.30 | 18.48 | 112.00 | 80-120 |

## Matrix Spike

A matrix spike is a sample spiked with a known amount of analyte and is another method of measuring the accuracy of the determination. Unlike the LCS, the matrix spike measures the effects of matrix interferences. The amount of the spike should be 0.5 - 10 times the analyte concentration in the sample. Spike recovery is calculated as follows:

$$R = 100 \times (S)/(T)$$

where,

R = spike recovery
S = measured concentration of spike (mg/L)
T = theoretical concentration of spiked sample

# Relative Percent Diference (RPD) of Spike and Duplicate

| Date Sampled | Date Prepared | Date Tested | Matrix Spike (MS) | Matrix Dupe (MD) | RPD % | RPD Limit |
|---|---|---|---|---|---|---|
| 9/12/2019 | 9/19/2019 | 9/19/2019 | 18.48 | 17.65 | 4.70 | 25.00 |

## Matrix Spike Duplicate

A matrix spike duplicate is an additional replica duplicate of the matrix spike. The measurement of the matrix spike sample follows the same prepartion and analytical testing as the original sample and will measure the precision and bias of method for a specific sample matrix. Duplicate Spike recovery is calculated as follows:

$$R = 100 \times (MS-MD)/(MD)$$

where,

MD = duplicate spike recovery
MS = measured concentration of spike (mg/L)

# Relative Percent Diference (RPD) of Spike and Duplicate

| Date Sampled | Date Prepared | Date Tested | Matrix Spike (MS) | Matrix Dupe (MD) | RPD % | RPD Limit |
|---|---|---|---|---|---|---|
| 9/12/2019 | 9/19/2019 | 9/19/2019 | 18.48 | 17.65 | 4.70 | 25.00 |

## Matrix Spike Duplicate

A matrix spike duplicate is an additional replica duplicate of the matrix spike. The measurement of the matrix spike sample follows the same prepartion and analytical testing as the original sample and will measure the precision and bias of method for a specific sample matrix. Duplicate Spike recovery is calculated as follows:

$$R = 100 \times (MS-MD)/(MD)$$

where,

MD = duplicate spike recovery
MS = measured concentration of spike (mg/L)

Table 1.0 : Measurement Quality Objectives for Sulfate/Sulfur

| Laboratory Quality Control | Frequency of Analysis | Measurement Quality Objectives |
|---|---|---|
| Calibration Standard | Per Analytical batch | Per analytical batch |
| Continuing Calibration Verification | Per 10 Analytical Batch | 80- 120% Recovery |
| Laboratory Blank | Per 20 samples or per analytical batch` | < RL Limit |
| Reference Material | Per 20 samples or per analytical batch` | 80- 120% Recovery |
| Matrix Spike | Per 20 samples or per analytical batch` | 80- 120% Recovery |
| Matrix Spike Duplicate | Per 20 samples or per analytical batch` | 80- 120% Recovery<br>RPD <25% for duplicates |
| Laboratory Duplicates | Per 20 samples or per analytical batch` | RPD <25% for duplicates |
| | | |
| | | |
| | | |

# LECO Certified Reference Material

*LECO Corporation; Saint Joseph, Michigan USA*

Description: Synthetic Carbon and Sulfur
Part No: 502-914
Lot No: 1001

ACCREDITED
Reference Material Producer
Certificate # 3285.02

LECO

LECO Certified Reference Materials (LCRM®) are traceable to national or international Certified Reference Materials whenever possible. When these Certified Reference Materials do not exist or are inadequate for calibration purposes, other appropriate materials are used. The accuracy of the reported results for LCRM® is greatly influenced by the accuracy of the primary reference materials used. The intended use of this LCRM® is for calibration purposes.

| Category | Reference Value | +/- |
|---|---|---|
| % Carbon | 0.98 | 0.03 |
| % Sulfur | 0.97 | 0.02 |

- +/- indicates an expanded uncertainty with a coverage factor times uncertainty value.
- Refer to the reverse side of certificate for additional information regarding calculations.

Homogeneity:
Homogeneity of this material was confirmed through analysis of a random selection of bottled material and quantified using an analysis of variance represented by H in the Analysis Data.

Material:
LCRM® 502-914 Lot: 1001 is a synthetic carbon and sulfur calibration material.

This LCRM® can be analyzed on a variety of LECO instrumentation. A minimum sample mass of 0.05 g is recommended for analysis. Refer to instrument manufacturer recommendations for nominal sample mass.

Traceability:
The following Certified Reference Materials and Reference Materials were used to validate the analytical data:
JK NR 21 Steel Chip @ 0.1741% Carbon.
LECO 502-630 Lot: 1011 Synthetic Carbon @ 0.53% Carbon.
LCRM® 502-696 Lot: 1000 Synthetic Carbon @ 1.00% Carbon.
LCRM® 502-902 Lot: 1000 Calcium Carbonate @ 12.01% Carbon.
LCRM® 502-909 Lot: 1000 Ore @ 0.19% Carbon and 0.68% Sulfur.
NIST SRM 16f Basic Open Hearth Steel Chips @ 0.97% Carbon.
NIST SRM 886 Refractory Gold Ore @ 1.466% Sulfur.
NIST SRM 915b Calcium Carbonate @ 12.0% Carbon.
NIST SRM 2690 Coal Fly Ash @ 0.15% Sulfur.

Preparation:
This LCRM® is suitable for use directly from the bottle without additional preparation.

Analysis:
LECO analytical instruments were used to characterize this material. This material was analyzed by high temperature combustion using a resistance furnace and an induction furnace utilizing LECO infrared (IR) detection technology.

| Category | Method/Detection | n |
|---|---|---|
| % Carbon | Combustion/IR | 120 |
| % Sulfur | Combustion/IR | 100 |

Certified Reference Material

# LECO Certified Reference Material

LECO Corporation; Saint Joseph, Michigan USA

ACCREDITED
Reference Material Producer
Certificate # 3285.02

## Description: Synthetic Carbon and Sulfur
## Part No: 502-964
## Lot No: 1000

*LECO Certified Reference Materials (LCRM®) are traceable to national or international Certified Reference Materials whenever possible. When these Certified Reference Materials do not exist or are inadequate for calibration purposes, other appropriate materials are used. The accuracy of the reported results for this LCRM® is greatly influenced by the accuracy of the primary reference materials used. The intended use of this LCRM® is for calibration purposes.*

| Category | Reference Value | +/- |
|---|---|---|
| % Carbon | 0.11 | 0.01 |
| % Sulfur | 0.10 | 0.01 |

- *+/- indicates an expanded uncertainty with a coverage factor times uncertainty value.*
- *Refer to the reverse side of certificate for additional information regarding calculations.*

Homogeneity:
*Homogeneity of this material was confirmed through analysis of a random selection of bottled material and quantified using an analysis of variance represented by H in the Analysis Data.*

Material:
*LECO 502-964 Lot: 1000 is a synthetic carbon and sulfur calibration material.*

*This LCRM® may be analyzed on a variety of LECO analytical instrumentation. A minimum sample mass of 0.1g is recommended for analysis. Refer to instrument manufacturer recommendations for nominal sample mass.*

Traceability:
*The following Certified Reference Materials and Reference Materials were used to validate the analytical data:*
*JK NR 21 Steel Chip @ 0.1741% Carbon*
*LCRM® 502-902 Lot: 1001 Calcium Carbonate @ 11.99% Carbon*
*LCRM® 502-914 Lot: 1001 Synthetic Carbon and Sulfur @ 0.98% Carbon and 0.97% Sulfur*
*LCRM® 502-934 Lot: 1000 Synthetic Carbon @ 0.54% Carbon*
*LCRM® 502-950 Lot: 1000 Synthetic Carbon @ 0.13% Carbon*
*NIST SRM 12h Basic Open Hearth Steel Chips @ 0.407% Carbon*
*NIST SRM 16f Basic Open Hearth Steel Chips @ 0.97% Carbon*
*NIST SRM 886 Refractory Gold Ore @ 1.466% Sulfur*
*NIST SRM 2690 Coal Fly Ash @ 0.15% Sulfur*

Preparation:
*This LCRM® is suitable for use directly from the bottle without additional preparation.*

Analysis:
*LECO instrumentation was used to characterize this material. This material was analyzed by high temperature combustion using resistance furnace and an induction furnace utilizing LECO infrared (IR) detection technology.*

| Category | Method/Detection | n |
|---|---|---|
| % Carbon | Combustion/IR | 90 |
| % Sulfur | Combustion/IR | 90 |



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# Certificate of Analysis

## AR-1700

## SULFUR IN COAL REFERENCE STANDARD

**LOT # 700219 LID ID # 700219**

**DRIED BASIS VALUE**

**WEIGHT PERCENT SULFUR = 0.36**

**EXPANDED UNCERTAINTY = ± 0.01**

**METHOD:**

**ASTM D 4239-17 AND ARI-035**

**This CRM is traced to N.I.S.T. SRM 2682b, SRM 2693 and NCS FC28113, FC28104**

**Alpha- AR1701-701912, AR1700-700715, AR1700-700910**

The intended use of this reference material is for the calibration and quality validation of sulfur by resistance furnace combustion, infra-red detection analysis as specified by ASTM D4239 or other valid test methods. The analytical values were derived by a number of data points (n=42) and reported in mass fraction. The sample size used and minimum sample size is approximately 300-500mg. The precision value represents the expanded degree of uncertainty based on errors from analytical assay at a 95% confidence level (k=2) utilizing ISO Guide 35, ANOVA, and the Guide to Uncertainty Measurement. Formal testing procedures should be followed when using this standard; this includes using the *reproducibility* and *repeatability* factors of the method for establishing overall analytical uncertainty. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Chief Chemist, at Alpha Resources.

The material used in production of this reference standard was identified in accordance with ARI 041. The samples for round robin testing were selected in accordance with ARI 031. The above values relate only to the material used to produce this standard. The analytical samples were dried per the NMI used or corrected for moisture as per the test method. This reference was produced in accordance to ISO 17034 and ISO Guide 31. Keep sealed and store under normal laboratory conditions.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. The above values relate only to the material used to produce this standard. This certificate cannot be reproduced except in full. This bottle contains 50g, minus 60 mesh (250 micron) coal powder. While unable to determine a definite shelf life, this reference standard should be reviewed 20 years from the date of certification. Once opened this certificate is valid for two years.

This is a Certified Reference Material and is traceable to the above-mentioned standards. For good laboratory practice, it is recommended that all standards be verified as fit for purpose prior to use. These test results are accredited under the Alpha Resources LLC laboratory's ISO/IEC 17025 and ISO 17034 accreditation (RMP) issued by ANSI-ASQ/ANAB. Refer to certificate and scope of accreditation(s) AT-1200 and AR-1920.

**EXPIRATION DATE**

**THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING**

Certified March 20, 2019

Kent Dyer

Chief Chemist

3090 Johnson Rd. • Stevensville, MI 49127-0199 • Phone (269) 465-5559 • Fax (269) 465-3629 • alpharesources.com

# Alpha Resources, Inc.
# Certificate Of Analysis

**AR-1684**
**ULTRA LOW SULFUR COAL STANDARD**

**LOT # 684616 LID ID # 684616**

**DRIED BASIS VALUE**

| | | |
|---|---|---|
| **WEIGHT PERCENT SULFUR** | **=** | **0.098** |
| **EXPANDED UNCERTAINTY** | **=** | **0.012** |

**METHOD:**
**Combustion by Resistance Furnace with IR Detection *ASTM 4239 (below method described range)**

**This Reference Material is traced to AR1683, AR1684, AR1685**

**This Reference Material (RM) was prepared by gravimetric blending. The analytical value was calculated from a number of data points (n=50) obtained on instrumentation using combustion by resistance furnace with IR detection similar to ASTM D4239. The precision value represents the expanded degree of uncertainty based on errors from analytical assay at a 95% confidence level (k=2). When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer at Alpha Resources. This RM is below actual test method limits and no known SRM/NMI references are available.**

**The material used for this standard was identified by AR 041. The samples for testing were selected in accordance with ARI 031. The above values relate only to the material used to produce this standard. The analytical samples were dried under a nitrogen atmosphere for a minimum of 30 minutes at 107° C ± 3°C, or until a steady mass is achieved. This bottle contains 50g fine powder to be used per your test method. Kept sealed this bottle has an indefinite shelf life. Once opened this certificate is valid for 2 years. Keep sealed and store under normal laboratory conditions.**

**Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. The above values relate only to the material used to produce this standard. This certificate cannot be reproduced except in full.**

**This is a RM, and is traceable to the above-mentioned standard(s). For good laboratory practice it is recommended that all standards be verified prior to use. This reference was produced in accordance to ISO Guide 34 and ISO Guide 31.**

*** Past certified RM were used in comparisons.**

## EXPIRATION DATE
## THIS RM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING

**Certified June 14, 2016**

Kent Dyer

P.O. Box 199 3090 Johnson Road Stevensville, MI 49127 USA Phone (269) 465-5559 Fax (269) 465-3629
www.alpharesources.com

PERMIT ATTACHMENT

SECTION N

# SUBPART BB EQUIPMENT LEAKS

Evoqua Water Technologies
2523 Mutahar Street
Parker, Arizona  85344

Revision 1
July 2019

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LIST OF CITED APPENDICES

## N.1 SUBPART BB EQUIPMENT LEAKS

The Subpart BB regulations are applicable to equipment that contains or contacts hazardous wastes with organic concentrations of at least ten (10) percent by weight.

The Subpart BB regulations further define equipment as being in light liquid service, gas/vapor service, and heavy liquid service. The Parker facility has determined that the Subpart BB requirements are not applicable, based on the characteristics of the spent carbon managed at the facility. This determination is based on review of waste profile information, in accordance with the requirements of 264.1063(d)(2).

A RCRA Subpart BB Compliance Plan is included in Appendix XIX of the Part B Permit Application.

# PERMIT ATTACHMENT

# APPENDIX XIX

## SUBPART BB COMPLIANCE PLAN

**Evoqua Water Technologies**

**2523 Mutahar Street**

**Parker, Arizona  85344**

**928-669-5758**

**July 2019**

**Revision 1**

# Subpart BB Compliance Plan

Hazardous Waste Treatment, Storage and Disposal Facilities and Hazardous Waste Generators; Organic Air Emission Standards for Equipment Leaks

## Evoqua Water Technologies

Parker, Arizona

Revision 1

July 2019

# Evoqua Water Technologies
# Subpart BB Compliance Plan
# Table of Contents



List of Appendices

Evoqua Water Technologies

# Subpart BB Compliance Plan

## 1. Introduction

This document summarizes the air emission standards that apply to equipment leaks at the Evoqua Water Technologies (Evoqua), Parker, Arizona facility under the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Subpart BB regulations (40 CFR §264.1050 et. seq.), and provides the plan to assure compliance with these standards. As detailed below, the Subpart BB regulations specifically allow for compliance to be demonstrated through adherence to Clean Air Act (CAA) requirements in 40 CFR Parts 60, 61, and/or 63 (see 40 CFR §264.1064(m)). The Evoqua Parker, Arizona facility is subject to the National Emission Standards (NESHAP) for Benzene Waste, codified at 40 CFR Part 61, Subpart FF. Compliance with Subpart FF equipment leak standards together with the procedures described in this plan comprise the facility's Subpart BB compliance program.

This plan will be updated from time-to-time to reflect changes in applicability and compliance. The most recent version of the plan will be maintained onsite in the facility files.

## 2. Facility Description

The Parker, Arizona facility reactivates spent carbon from facilities that are both subject to and exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA).

## 3. Management Summary of Rule Requirements

Under Section 3004(n) of the authority of RCRA, the EPA has established standards to control air emissions from hazardous waste treatment, storage and disposal facilities as may be necessary to protect human health and the environment. Briefly, the EPA has established air emission standards for the following hazardous waste management units:

- Process Vents - referred to as Subpart AA regulations (codified at 40 CFR §264.1030, et seq.)
- Equipment Leaks[1] - referred to as Subpart BB regulations (codified at 40 CFR §264.1050, et seq.)
- Tanks, Surface Impounds and Containers - referred to as Subpart CC regulations (codified at 40 CFR §264.1080, et seq.)

None of the waste management units at the facility are subject to Subpart AA. Briefly, the facility is not subject to Subpart AA as there are no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping (§264.130). Compliance with Subpart CC is largely accomplished under the provisions of 40 CFR §264.1080(b)(7), which allows compliance to be demonstrated through the Clean Air Act provisions of 40 Parts 60, 61, and/or 63. Evoqua has prepared a separate plan addressing its procedures to assure ongoing compliance with Subpart CC.

The remainder of this document addresses Evoqua's specific compliance obligations under Subpart BB.

## 4. Evoqua Water Technologies Subpart BB Compliance Plan

### 4.1 Subpart BB Applicability

The Parker, Arizona facility complies with Subpart BB in large part via the provisions of 40 CFR 264.1064(m), which allows compliance under the CAA to satisfy Subpart BB obligations. EPA stated the following relative this approach:

"Paragraph §264.1064(m) in the recordkeeping requirements states that the owner or

1 The equipment regulated under Subpart BB include pumps, compressors, pressure relief devices, sampling connection systems, valves, open-ended valves or line, and flanges. These components shall be referred to as "Equipment" throughout this plan.

operator "…may elect to determine compliance with this subpart either by documentation pursuant to §264.1064 of this subpart [i.e., Subpart BB], or by documentation of compliance with the regulations at 40 CFR Part 60, Part 61, or Part 63." The corresponding Part 265 language is the same. The objective of the amendment was to eliminate any owner or operator burden caused by regulatory overlap. In making the revision to paragraph (m) in §2641064 and §265.1064 of Subpart BB, the Agency intended that, for a piece of equipment subject to equipment leak regulations under the CAA as well as RCRA Subpart BB, compliance with the CAA rules rather than the RCRA Subpart BB requirements would adequate demonstration of compliance with and in effect eliminate the need to demonstrate compliance under Subpart BB of the RCRA Air Rules."[2]

The Parker, Arizona facility is subject to NESHAP Subpart FF, a 40 CFR Part 61 CAA regulation, and satisfies its obligations under Subpart BB via compliance with the Subpart FF leak detection requirements. The facility has prepared a detailed compliance plan describing the applicable emissions standards, and the procedures to satisfy the testing, monitoring, recordkeeping, and reporting obligations under the FF standards.

Figure 1 provides a process flow diagram (PFD) identifying those portions of the facility that demonstrate compliance with Subparts BB and CC via Subpart FF. The figure also shows the processes and equipment potentially subject to Subpart BB (and Subpart CC), but that are exempt from the control standards based on the volatile organic (VO) concentration of the material in contact with the equipment. Finally, the figure also identifies those processes and equipment that are not in contact with hazardous waste and are therefore not subject to Subparts BB or CC standards (e.g., utilities, cooling water, etc.).

Evoqua considers all equipment subject to Subpart BB as also subject to NESHAP Subpart FF. Since the equipment is subject to Subpart FF, Evoqua does not implement the emissions or work practice standards embodied in Subpart BB. The leak detection and other methods described in Subpart FF satisfy Evoqua's monitoring and repair obligations under Subpart BB; Evoqua maintains records in accordance with the requirements of Subparts FF and BB. Appendix A provides a list of the equipment that is potentially subject to Subpart BB. This same list of equipment is also included in the Subpart FF compliance plan and is identified on appropriate Subpart FF inspection and recordkeeping forms.

## 4.2 Equipment Exempt from Subpart BB Standards

As shown in Figure 1, there are some portions of the facility that are not specifically regulated under the Subpart FF standards. Equipment that come in contact with hazardous waste, but are not specifically regulated under Subpart FF are potentially subject to Subpart BB. As demonstrated

2 See Page 5 of *CAA and RCRA Overlap Provisions in Subparts AA, BB, and CC of 40 CFR Part 264 and 265*, USEPA, RCRA Programs Branch, Region IV, Atlanta, GA, October 2000.

below, this equipment is not subject to Subpart BB because the equipment does not come in contact with hazardous waste with an organic concentration of at least 10 percent by weight (40 CFR §264.1050(b)), or the equipment is exempt from RCRA permitting. Specific equipment exempt from the Subpart BB standards include:

- Tank T-19 Tank System: This tank recirculates water to the packed bed scrubber and is the introduction point for makeup water added to the scrubber system. City water is used for makeup.

- Tank T-11 Tank System: This tank collects scrubber water blow down, cooling water blow down, boiler blow down and excess recycle water. This tank is part of the wastewater treatment system and is therefore exempt from RCRA permitting.

- Equipment Downstream of the Afterburner (AB-2): This equipment is downstream of AB-2 and includes the Gas Cooler/Venturi Scrubber (SC-11), the Caustic Packed Scrubber (SC-12), the Wet Electrostatic Precipitator (WESP-11), and the Exhaust Stack.

- Emission Capture and Control System Associated with the Spent Carbon Unloading Hoppers (Equipment associated with the Baghouse and WS-2): The unloading hoppers are vented to a baghouse and carbon canister control system. This baghouse and carbon canister system are designed to reduce carbon dust emissions and vapors incident to unloading into the unloading hoppers.

## 4.3 Subpart BB Exemption Procedures

Operator knowledge provides the basis to conclude that certain equipment is exempt from the provisions of Subpart BB. As per 40 CFR 264.1063(d), the facility provides the following documentation to support these exemptions:

- Equipment associated with Tanks T-11 and T-19: The organic concentration of wastes introduced and managed in these tanks is significantly below the 10% threshold. Tank T-11, which potentially contains more VO since it is in wastewater service, was tested during four sampling events. Multiple sampling events have demonstrated the VO concentration results are below 1 mg/l. The sampling results for these events are maintained at the facility.

- Equipment associated with Systems Downstream of the Afterburner (AB-2): Compliance with Subpart FF emission standards for control devices assures the exemption status of this equipment. Under Subpart FF, AB-2 must achieve 99+% benzene destruction efficiency. The benzene destruction efficiency is a good surrogate for VO that may be present in the exhaust stream. The exhaust stream from AB-2 contains parts per billion (ppb) levels of organics, well below the 10% threshold. Testing data are supporting this determination are maintained in the facility files.

- Equipment associated with the Emission Control System for the Spent Carbon Unloading Hoppers: Evoqua has monitored the vapor stream that is vented to the carbon canister control system (WS-2) with a Total Vapor Analyzer (TVA). The TVA detects all hydrocarbons that may be present in the stream and reports the value in the units of parts per million volume (ppmv), as methane. Test data collected at the facility over many years indicate that the total hydrocarbon concentration in the inlet vapor stream is less than 5 ppmv. These data in ppmv if converted to a mass basis (ppmw or ppm) would be less than 5 ppmw as well. Measured data demonstrating the exemption status of this equipment is maintained in the facility files; three years of recent sampling data are provided in Appendix B to this plan.

- All Other Equipment Shown in Figure 1: These systems do not come in contact with hazardous waste and are therefore not regulated under Subpart BB.

The facility must review, and as necessary, update its exempt status determinations for equipment potentially subject to Subpart BB whenever the owner or operate takes any action that could result in an increase in the total organic content of the waste contained in or contacted by equipment subject to the standards (see 40 CFR §264.1063(d)(3) and §264.1064(k)(3)). The facility conducts these analyses/determinations, as required.

## 4.4 Monitoring Requirements

The specific monitoring requirements applicable to equipment potentially subject to Subpart BB are detailed in the Subpart FF Compliance Plan.

## 4.5 Recordkeeping Requirements

The facility must maintain records to demonstrate compliance with Subpart BB. For equipment subject to Subpart BB, the facility maintains records in accordance with NESHAP Subpart FF. Please see the Subpart FF compliance plan for additional information (40 CFR §264.1064(m)). For equipment exempt from Subpart BB, please reference Section 4.3 regarding the records and other information used to demonstrate the exemption status of the equipment. Documentation of exempt status must be maintained in accordance with 40 CFR §264.1064(k).

## 4.6 Reporting Requirements

40 CFR §264.1065 details the semi-annual reporting obligations under Subpart BB. The semi-annual

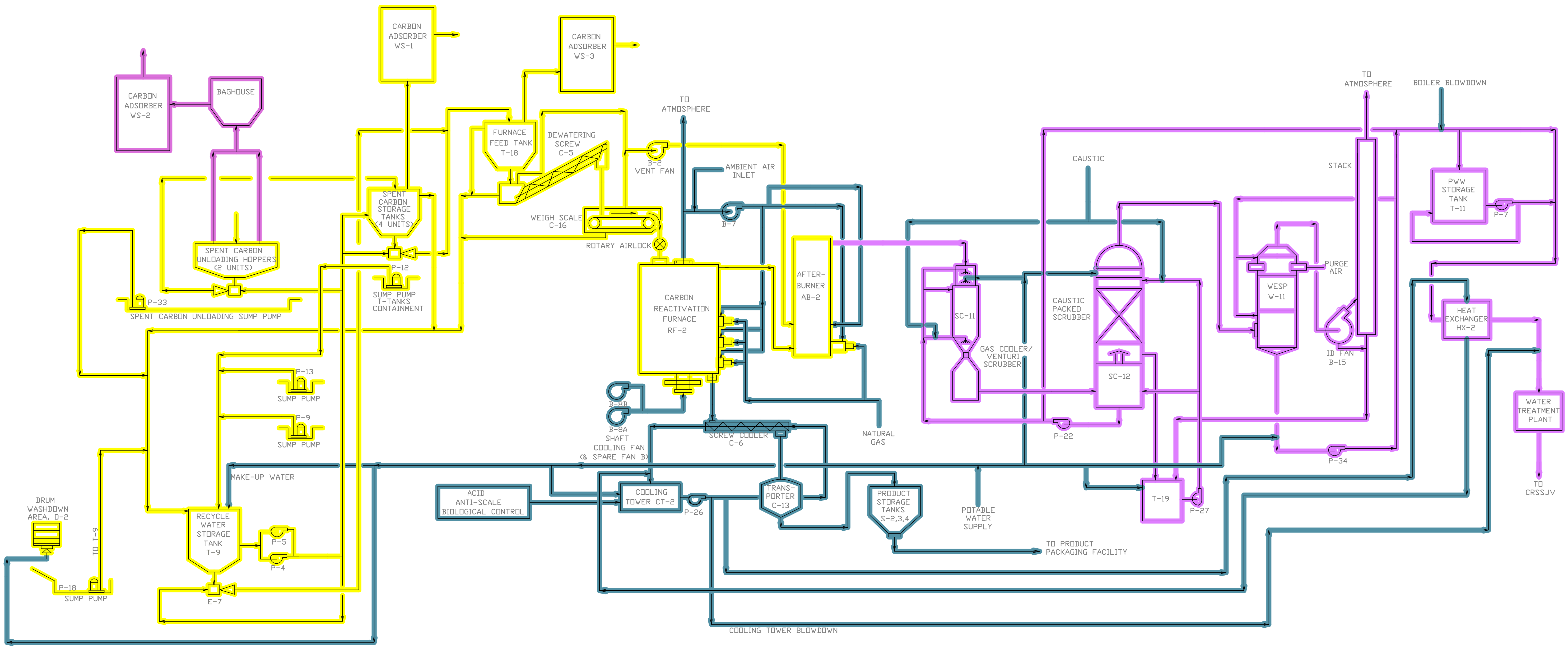
report must include the following:

- Information about leaks not repaired as per the requirements of Subpart BB;
- Dates of process unit shutdowns; and
- Information about exceedances related to the operation of control devices subject to the Subpart BB standards.

If during a reporting period any leaks from valves, pumps, and compressors are repaired as per the requirements of Subpart BB, and if Subpart BB control devices do not exceed or operate outside of design specifications (as defined in 40 CFR §265.1064(e)) for more than 24 hours, then no report is required (40 CFR §264.1065(b)).

Since the facility demonstrates compliance with Subpart BB via the requirements of Subpart FF, and that there are no equipment and control devices subject to the specific monitoring or control standards of Subpart BB, no reporting is required under Subpart BB. Notwithstanding this reporting exemption in Subpart BB, the facility is subject to certain reporting requirements in Subpart FF, as detailed in the Subpart FF compliance plan.

# Appendix A
# Equipment Subject to Subpart BB




SUBJECT TO NESHAP SUBPART FF

EXEMPT FROM SUBPARTS BB, CC, AND FF (SEE COMPLIANCE PLANS FOR BASES)

NOT SUBJECT TO SUBPARTS BB & CC (DOES NOT COME IN CONTACT WITH HAZARDOUS WASTE)

| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 0 | KAC | ATH | | UPDATED FROM PC-1466 PR-003 | 3-5-19 |

CBE CHAVOND-BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

PROCESS FLOW DIAGRAM
SUBPARTS BB, CC, AND FF APPLICABILITY

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 1/10/01 | KEM | 1/18/07 | | |

| SCALE | DWG. NO. | REV. |
|---|---|---|
| NONE | FIGURE 1 | 0 |

PRINT DATE: 3/7/19

### Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 1 | **H-1 Hopper Waste Feed Closed** | Visual and Method 21 Inspections, per Subpart FF |
| 2 | **H-1 Hopper Eductor Flanges and Victaulics** | |
| 3 | **H-1 Hopper Flanges, Piping and Victaulics** | |
| 4 | **H-2 Hopper Waste Feed Closed** | |
| 5 | **H-2 Hopper Eductor Flanges and Victaulics** | |
| 6 | **H-2 Hopper Piping and Victaulics** | |
| 7 | **RF-2 Hearth 1 Door West** | |
| 8 | **RF-2 Seal Welded Flat - between 1 and 2** | |
| 9 | **RF-2 Hearth 2 Door East** | |
| 10 | **RF-2 Seal Welded Flat - between 2 and 3** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 11 | **RF-2 Hearth 3 Door East** | Visual and Method 21 Inspections, per Subpart FF |
| 12 | **RF-2 Seal Welded Flat - between 3 and 4** | |
| 13 | **RF-2 Hearth 4 Door East** | |
| 14 | **RF-2 Seal Welded Flat - between 4 and 5** | |
| 15 | **RF-2 Hearth 5 Door East** | |
| 16 | **RF-2 Welded Seam on Furnace Bottom** | |
| 17 | **RF-2 Top Sand Seal** | |
| 18 | **RF-2 Bottom Sand Seal** | |
| 19 | **RF-2 Carbon Outlet Piping and Flanges** | |
| 20 | **T-1 Ball Valves** | |
| 21 | **T-1 Couplings** | |
| 22 | **T-1 Eductor & Fittings** | |
| 23 | **T-1 Fill Slurry Lines & Vics From H-1, H-2** | |
| 24 | **T-1 Fittings & Valves** | |

*This list is updated from time-to-time based on equipment in service at the facility. See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

### Evoqua Water Technologies - Parker, AZ Facility

## Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

### 40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 25 | **T-1 (SEE ATTACHMENT No. 1)** | Visual and Method 21 Inspections, per Subpart FF |
| 26 | **T-1 Pressure Relief Valve** | |
| 27 | **T-1 Slurry Line** | |
| 28 | **T-1 Tank Flanges** | |
| 29 | **T-1 Vent Pipe To WS-1** | |
| 30 | **T-2 Ball Valves** | |
| 31 | **T-2 Couplings** | |
| 32 | **T-2 Eductor & Fittings** | |
| 33 | **T-2 Fill Slurry Lines & Vics From H-1, H-2** | |
| 34 | **T-2 Fittings & Valves** | |
| 35 | **T-2 Tank (SEE ATTACHMENT No. 1)** | |
| 36 | **T-2 Pressure Relief Valve** | |
| 37 | **T-2 Slurry Line** | |
| 38 | **T-2 Tank Flanges** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

**Evoqua Water Technologies - Parker, AZ Facility**

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

**40 CFR 264.1064(m), 61.343, 61.345, 61.349**

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 39 | **T-2 Vent Pipe To WS-1** | Visual and Method 21 Inspections, per Subpart FF |
| 40 | **T-5 Ball Valves** | |
| 41 | **T-5 Couplings** | |
| 42 | **T-5 Eductor & Fittings** | |
| 43 | **T-5 Fill Slurry Lines & Vics From H-1, H-2** | |
| 44 | **T-5 Fittings & Valves** | |
| 45 | **T-5 (SEE ATTACHMENT No. 2)** | |
| 46 | **T-5 Pressure Relief Valve** | |
| 47 | **T-5 Slurry Line** | |
| 48 | **T-5 Tank Flanges** | |
| 49 | **T-5 Vent Pipe To WS-1** | |
| 50 | **T-6 Ball Valves** | |
| 51 | **T-6 Couplings** | |
| 52 | **T-6 Eductor & Fittings** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 53 | **T-6 Fill Slurry Lines & Vics From H-1, H-2** | Visual and Method 21 Inspections, per Subpart FF |
| 54 | **T-6 Fittings & Valves** | |
| 55 | **T-6 (SEE ATTACHMENT No. 2)** | |
| 56 | **T-6 Pressure Relief Valve** | |
| 57 | **T-6 Slurry Line** | |
| 58 | **T-6 Tank Flanges** | |
| 59 | **T-6 Vent Pipe To WS-1** | |
| 60 | **T-9 (SEE ATTACHMENT No. 3)** | |
| 61 | **T-9 Level Transmitter** | |
| 62 | **T-9 Main Bottom Manway Door** | |
| 63 | **T-9 Return Line and Fittings From T Tanks** | |
| 64 | **T-9 Return Line and Fittings From T-18** | |
| 65 | **T-9 Sump Pump Fittings** | |
| 66 | **T-9 Vent Line and Fittings To WS-1** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

Evoqua Water Technologies - Parker, AZ Facility

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

40 CFR 264.1064(m), 61.343, 61.345, 61.349

| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 67 | T-9/P-4 Pump - Inlet Pipe and Fittings | Visual and Method 21 Inspections, per Subpart FF |
| 68 | T-9/P-5 Pump - Inlet Pipe and Fittings | |
| 69 | T-9/P-4 Pump - Outlet Pipe and Fittings | |
| 70 | T-9/P-5 Pump - Outlet Pipe and Fittings | |
| 71 | T-18 Feed Hose & Couplings | |
| 72 | T-18 Feed Valve & Piping | |
| 73 | T-18 Level Indicators | |
| 74 | T-18 Lids (SEE ATTACHMENT No. 4) | |
| 75 | T-18 Return Line, Couplings and Vics | |
| 76 | T-18 Piping and Couplings From T-Tanks | |
| 77 | WS-1 Hatches & Sample Port | |
| 78 | WS-1 Inlet | |
| 79 | WS-1 Outlet | |
| 83 | WS-3 Hatches & Sample Port | |

*This list is updated from time-to-time based on equipment in service at the facility. See current Subpart FF inspection records for equipment subject to inspection.

Updated March 2019

**Evoqua Water Technologies - Parker, AZ Facility**

# Equipment Subject to Subpart BB with Compliance Demonstrated via Subpart FF

**40 CFR 264.1064(m), 61.343, 61.345, 61.349**

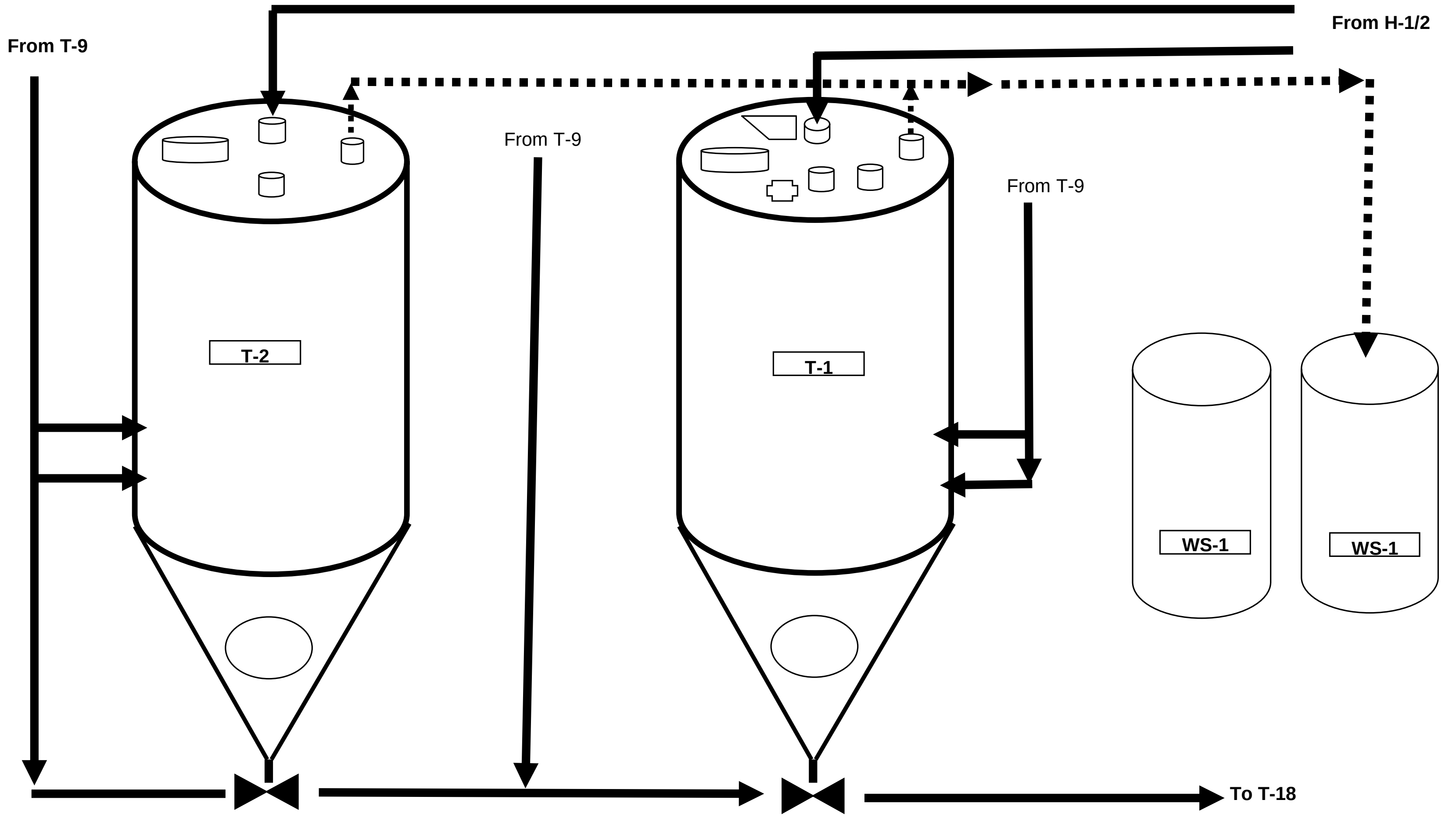
| No. | Location ID | Compliance Demonstration Methods |
|---|---|---|
| 84 | **WS-3 Inlet** | Visual and Method 21 Inspections, per Subpart FF |
| 85 | **WS-3 Outlet** | |
| 86 | **Dewater Screw (SEE ATTACHMENT No. 4)** | |
| 87 | **Weigh Belt Feeder (SEE ATTACHMENT No. 4)** | |
| 88 | **Rotary Valve (SEE ATTACHMENT No. 4)** | |

*This list is updated from time-to-time based on equipment in service at the facility.  See current Subpart FF inspection records for equipment subject to inspection.

Evoqua Water Technologies

Parker Facility

Component Inspection Diagrams

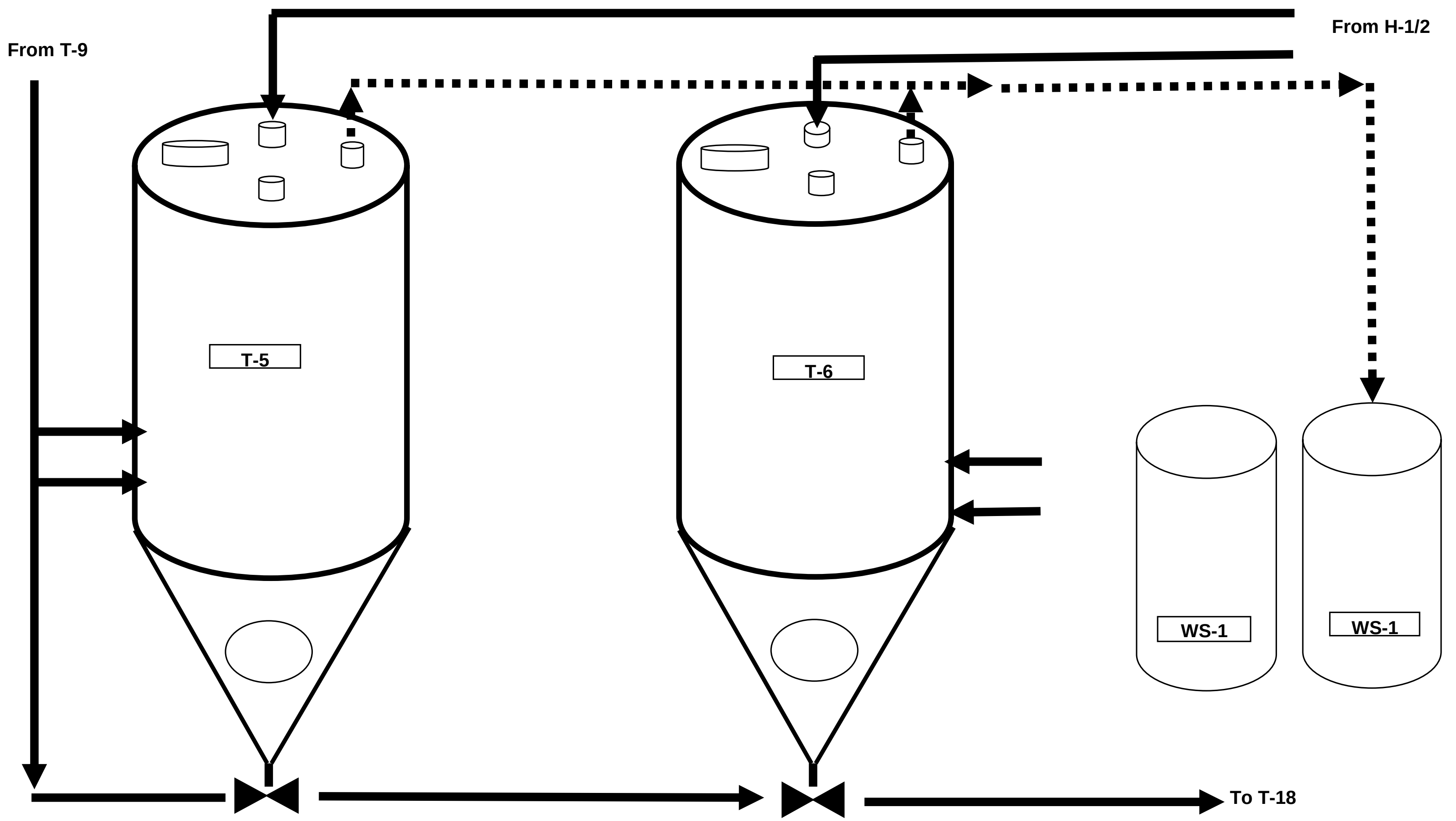



Attachment No. 1

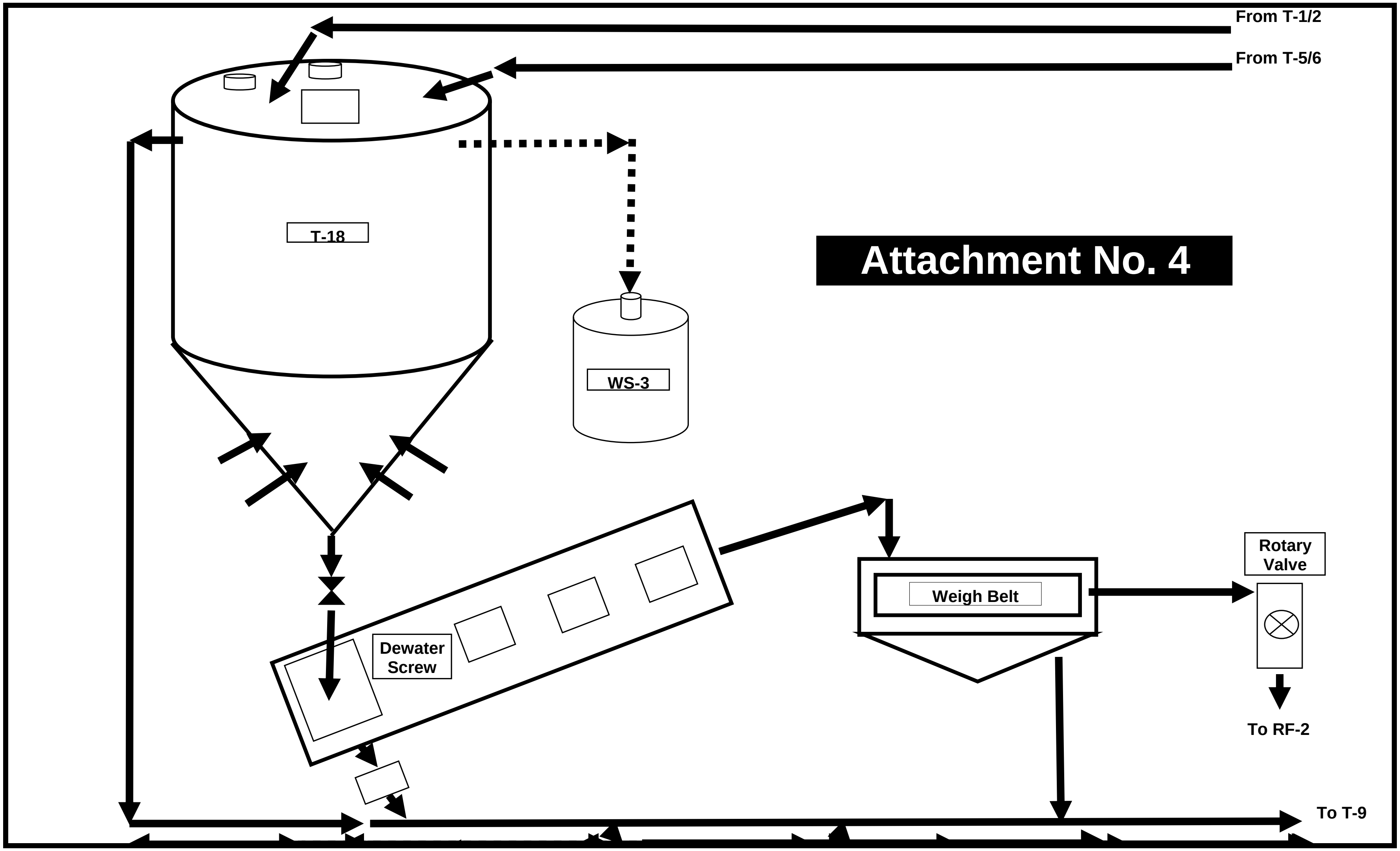
Evoqua Water Technologies

Parker Facility

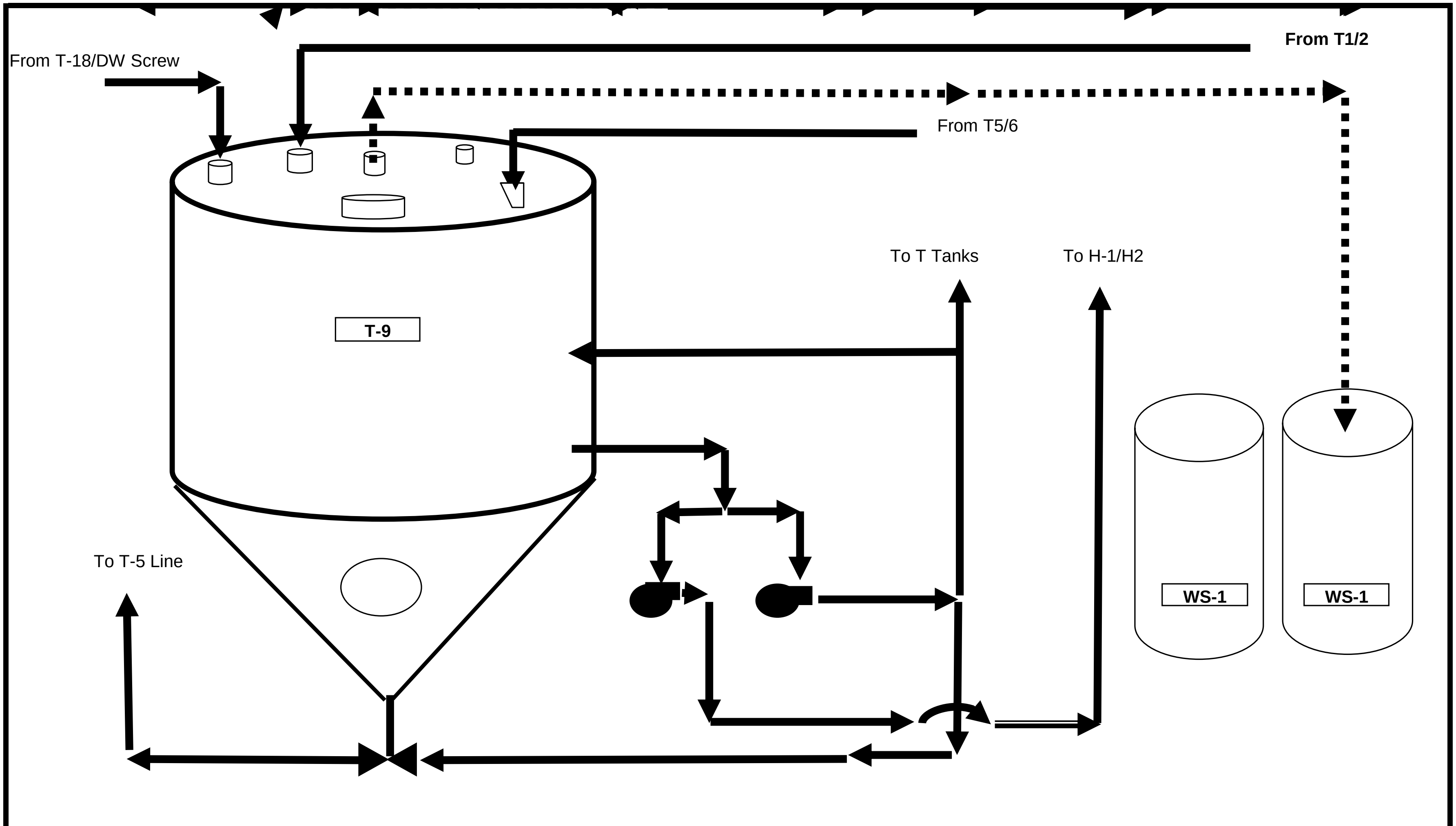
Component Inspection Diagrams




Attachment No. 2


From T-1/2
From T-5/6
T-18
WS-3
Attachment No. 4
Dewater Screw
Weigh Belt
Rotary Valve
To RF-2
To T-9

Evoqua Water Technologies Parker Facility Component Inspection Diagrams




# Attachment No. 3

Appendix B

Data to Support Subpart BB Exemptions

(See Line Item 85 in the attached records)

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By: Monte McCue August 24, 2016**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 8/24/2016 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 8/24/2016 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 8/24/2016 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 8/24/2016 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 8/24/2016 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 8/24/2016 | 4650 | NA | N | | | NA |
| 83 | WS-1 Outlet | 8/24/2016 | 5 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 8/24/2016 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 8/24/2016 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 8/24/2016 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

## Evoqua Water Technologies - Parker, AZ Facility
# Annual Method 21 Testing
### 40 CFR 61.343, 345, 349

**Instrument Used: Foxboro TVA 1000 FID** **Tested By: Monte McCue August 16, 2017**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 8/16/2017 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 8/16/2017 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 8/16/2017 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 8/16/2017 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 8/16/2017 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 8/16/2017 | 3000 | NA | N | | | NA |
| 83 | WS-1 Outlet | 8/16/2017 | 25 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 8/16/2017 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 8/16/2017 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 8/16/2017 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

## Evoqua Water Technologies - Parker, AZ Facility
# Annual Method 21 Testing
### 40 CFR 61.343, 345, 349

**Instrument Used: Foxboro TVA 1000 FID** **Tested By: Monte McCue July 19, 2018**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 76 | H-18 Feed Valve & Piping | 7/19/2018 | <5 | <5 | N | | | NA |
| 77 | H-18 Level Indicators | 7/19/2018 | <5 | <5 | N | | | NA |
| 78 | H-18 Lids (SEE ATTACHMENT No. 4) | 7/19/2018 | | | N | | | NA |
| 79 | H-18 Return Line, Couplings and Vics | 7/19/2018 | <5 | <5 | N | | | NA |
| 80 | H-18 Piping and Couplings From T-Tanks | 7/19/2018 | <5 | <5 | N | | | NA |
| 81 | WS-1 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 82 | WS-1 Inlet | 7/19/2018 | 3000 | NA | N | | | NA |
| 83 | WS-1 Outlet | 7/19/2018 | 25 | <5 | N | | | NA |
| 84 | WS-2 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 85 | WS-2 Inlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 86 | WS-2 Outlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 87 | WS-3 Hatches & Sample Port | 7/19/2018 | <5 | <5 | N | | | NA |
| 88 | WS-3 Inlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 89 | WS-3 Outlet | 7/19/2018 | <5 | <5 | N | | | NA |
| 90 | Dewater Screw (SEE ATTACHMENT No. 4) | 7/19/2018 | | | N | | | NA |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

# PERMIT ATTACHMENT

# SECTION O

## SUBPART CC AIR EMISSION STANDARDS

Evoqua Water Technologies
2523 Mutahar Street
Parker, Arizona 85344

Revision 8
July 2019

TABLE OF CONTENTS



LIST OF CITED APPENDICES

## O.1 SUBPART CC AIR EMISSION STANDARDS

The Evoqua Water Technologies Parker facility manages all tanks and containers regulated by the requirements of Subpart CC as specified in Section O. The Subpart CC Compliance Plan is located in Appendix XX.

# PERMIT ATTACHMENT

# APPENDIX XX

# SUBPART CC COMPLIANCE PLAN

EVOQUA WATER TECHNOLOGIES
2523 Mutahar Street
PARKER, ARIZONA

Revision 8
July 2019

# Subpart CC Compliance Plan

Hazardous Waste Treatment, Storage and Disposal Facilities
and Hazardous Waste Generators; Organic Air Emission
Standards for Tanks, Surface Impoundments and Containers

## Evoqua Water Technologies

Parker, Arizona

Revision 8
July 2019

# Evoqua Water Technologies
# Subpart CC Compliance Plan
## Table of Contents



## List of Appendices

# Subpart CC Compliance Plan

## 1. Introduction

This document summarizes the applicable air emission standards that apply to tanks, surface impoundments and containers used to manage hazardous waste relative to the Evoqua Water Technologies, Parker, Arizona facility under the U.S. Environmental Protection Agency (EPA) final Subpart CC regulations (40 CFR §264.1080 et. seq.), and provides the plan to assure compliance with these standards. As discussed below, the Subpart CC regulations specifically exempt waste management operations performed in tanks and containers that comply with the National Emission Standards for Benzene Waste Operations promulgated by the EPA under the Section 112 of the Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAP), codified at 40 CFR Part 61, Subpart FF. This plan describes how the Subpart FF requirements are integrated into the overall compliance approach for the Subpart CC regulations. Records related to any deferral or exemption from Subpart CC due to compliance with Subpart FF are maintained onsite, as per 40 CFR §§264.1089(a) and (j).

This plan will be updated from time-to-time to reflect changes in applicability and compliance. The most recent version of the plan will be maintained onsite in the facility files.

## 2. Facility Description

The Parker, Arizona facility reactivates spent carbon from facilities that are both subject to and exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA).

3. Management Summary of Rule Requirements

Under Section 3004(n) of the authority of the Resource Conservation and Recovery Act (RCRA), the EPA has established standards to control air emissions from hazardous waste treatment, storage and disposal facilities as may be necessary to protect human health and the environment. Briefly, the EPA has established air emission standards for the following hazardous waste management units:

- Process Vents - referred to as Subpart AA regulations (codified at 40 CFR §264.1030, et seq.)

- Equipment Leaks from Pumps, Valves and Compressors - referred to as Subpart BB regulations (codified at 40 CFR §264.1050, et seq.)

- Tanks, Surface Impounds and Containers - referred to as Subpart CC regulations (codified at 40 CFR §264.1080, et seq.)[1]

None of the waste management units at the facility is subject to Subpart AA. Briefly, the facility is not subject to Subpart AA as there are no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping (§264.130). The facility is subject to Subpart BB. Compliance with Subpart BB is accomplished as described in a separate Subpart BB Compliance Plan.

This document addresses Evoqua's compliance obligations under Subpart CC. Relative to the Parker facility, the final Subpart CC regulations exempt all hazardous waste management units from all Subpart CC emission control, monitoring, sampling, testing, reporting and record keeping requirements provided the facility certifies that these waste management units are equipped and operated with air emission controls in accordance with the Benzene Waste

[1] Subpart CC regulations have a lengthy regulatory history. Briefly, the final standards were originally promulgated on December 6, 1994 (59 FR 69826). The final rule caused much confusion and met with substantial opposition from the regulated community. The effective date of the rule was extended on three separate occasions (60 FR 26828, May 19, 1995; 60 FR 56952, November 13, 1995 and 61 FR 28508, June 5, 1996); EPA issued three subsequent final interpretive ruling to clarify Subpart CC requirements and to request additional public comment (60 FR 41870, August 14, 1995 and 61 FR 4903, February 9, 1996 and 61 FR 59932, November 25, 1996).

Operations NESHAP (40 CFR §61.340, et seq.). The final Subpart CC standards allow compliance with Clean Air Act requirements to satisfy Subpart CC obligations at 40 CFR §264.1080(b)(7), which states:

> (b) The requirements of this subpart [Subpart CC] do not apply to the following waste management units at the facility:
>
> * * * * * * * * * * * * *
>
> (7) A hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR 60, 61 or part 63. For the purpose of complying with this paragraph, a tank for which the air emission control includes an enclosure, as opposed to a cover, must be in compliance with the enclosure and control device requirements of §264.1084(i), except as provided in §264.1082(c)(5).

Further, a tank or container for which all hazardous waste entering the unit has an average volatile organic (VO) concentration at the point of waste origination of less than 500 parts per million by weight (ppmw) is subject to Subpart CC, but is exempt from air emissions control requirements (§264.1082(c)). The average VO concentration is to be determined either by sampling and testing as directed by Subpart CC or by operator knowledge of the waste (§264.1083). If test data are used as the basis for knowledge, then the operator must document the test method, sampling protocol, and the means by which sampling and analytic variability are accounted for in determination of average VO concentration (§265.1084(a)(4)(ii), as referenced by §264.1083). Operators that rely on average VO concentration in a hazardous waste to exempt a unit from air emission controls must review and update, as necessary, this determination at least once every 12 months following the initial determination ((§264.1082(c)(1)).

Waste management units that contain hazardous waste with an average VO concentration greater than 500 ppmw (and are not subject to the Benzene Waste NESHAP) must comply with prescribed air emission control requirements, testing, monitoring and reporting provisions (§§264.1084-1087). Currently, only certain containers are subject to air control requirements of Subpart CC. As noted above, the compliance plan will be updated in the future to describe these control requirements should the applicability or exemption status of units at the facility change.

## 4. Evoqua Water Technologies Subpart CC Compliance Plan

This Subpart CC compliance plan addresses three types of waste management units:

- Waste management units (containers) that are regulated per Subpart CC requirements;
- Waste management units that are exempt from Subpart CC requirements because they are otherwise regulated under the Benzene Waste Operation NESHAP; and
- Waste management units that contain hazardous wastes that have a volatile organic (VO) concentration less than 500 ppmw at the point of waste origination, and are therefore exempt from the Subpart CC air emissions control requirements (§§264.1084-1087). Record keeping and monitoring requirements under Subpart CC apply to these units (§§264.1082(c)(1) and 1089(f)).

Compliance requirements for each of these categories of waste management units is discussed below.

### 4.1 Subpart CC Applicability

Figure 1 provides a process flow diagram (PFD) identifying those portions of the facility that demonstrate compliance with Subparts CC via Subpart FF. The figure also shows the processes and equipment potentially subject to Subpart CC, but are exempt from the standards based on exemptions under RCRA or the organic concentration (VO) of the material entering the waste management unit. Finally, the drawing shows equipment and systems that are exempt from Subparts CC (and Subparts BB and FF) because they do not come in contact with hazardous waste (e.g., utilities, cooling water, etc.). Further justification for the Subpart CC exemptions are provided below. Justifications for Subparts BB and FF exemptions are provided in their respective compliance plans.

In addition to Figure 1, the following two tables summarize the compliance requirements for waste management units potentially subject to Subpart CC. Table 1 lists the waste management units at the facility that are potentially subject to Subpart CC requirements but are instead regulated under Subpart FF, together with the applicable Benzene Waste NESHAP Subpart FF requirement to which they are subject. The Subpart FF references are provided because compliance with Subpart FF satisfies all compliance obligations under Subpart CC, as per 40 CFR §264.1080(a)(7). Table 2 lists the waste management units at the facility that are subject to Subpart CC control requirements as they are not regulated under Subpart FF.

Table 1
List of Waste Management Units and other Equipment that Comply with Subpart CC via Subpart FF

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART FF STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite - Subject to Subpart FF | §61.345 | Subpart FF wastes are stored in drums and other containers compliant with §61.345. Compliance with Subpart FF monitoring requirements are satisfied by the Generator. |
| N/A | Containers/Bins Storing Wastes Generated Onsite | §61.345<br>§61.342(f) | Benzene wastes shipped offsite must meet container and offsite shipment requirements. |
| H-1<br>H-2 | Spent carbon unloading hoppers, Nos. 1 and 2. | §61.346 | Both hoppers H-1 and H-2 receive spent carbon from containers and are managed as Subpart FF-affected units. |
| T-1 | Spent Carbon Storage Tank | §61.343 | Tank T-1 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-2 | Spent Carbon Storage Tank | §61.343 | Tank T-2 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-5 | Spent Carbon Storage Tank | §61.343 | Tank T-5 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-6 | Spent Carbon Storage Tank | §61.343 | Tank T-6 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART FF STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| T-9 | Recycle Water Tank | §61.343 | Tank T-9 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-1). |
| T-18 | Furnace Feed Tank | §61.343 | Tank T-18 is managed as a Subpart FF-affected unit. Tank vapors are controlled by carbon adsorber (WS-3). |
| RF-2<br>AB-2 | Reactivation Furnace No.2 and Afterburner No. 2 | §61.348 | Regenerated/reactivated carbon is a product and the Afterburner (AB-2) must meet 99+% benzene destruction efficiency. |
| C-5<br>C-16 | Dewater Screw and Weight Belt | §61.346(a) | Emissions routed to the Afterburner (AB-2) |
| WS-1 | Carbon Adsorber No.1 | §61.349 | Carbon canister, used to control volatile emissions from Tanks T-1, T-2, T-5, and T-6. |
| WS-3 | Carbon Adsorber No.3 | §61.349 | Carbon canister, used to control volatile emissions from Tank T-18. |

Table 2
List of Waste Management Units Subject to Subpart CC Control Requirements

| I.D. NO. | DESCRIPTION | APPLICABLE SUBPART CC STANDARD (40 CFR §) | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite – Not Subject to Subpart FF | 40 CFR 264.1086(c) | All RCRA containers received at the facility are managed compliant with US DOT hazardous material packaging requirements - i.e., containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)) and equipped with a cover and closure devices that form a continuous barrier such that there are no visible holes, gaps or other open spaces. |

Tanks T-11 and T-19, which are not listed in Table 1 or Table 2, are exempt from Subpart CC based on RCRA permitting status or the VO concentration of the materials introduced to the tank.

Tank T-11 is not subject to Subpart CC because it is part of a tank system that constitutes a wastewater treatment unit and therefore it is exempt from RCRA permitting and RCRA Subtitle C standards pursuant to 40 CFR §270.1(c)(2)(v).

Tank T-19, which is part of the off-gas scrubber equipment, recirculates water to the packed bed scrubber and is the introduction point for makeup water added to the scrubber system. City water is used for makeup. This tank is exempt from CC controls based on the VO concentration of the water conveyed to this tank from the scrubber. Evoqua uses operator knowledge to make this determination, consistent with 40 CFR §264.1083(a)(2).

The next section addresses the container standards that are applicable to the facility.

4.2 Container Standards 40 CFR §264.1086 (c)

A variety of container types are used to store and manage spent carbon and other wastes at the facility. All of these containers, including bulk bags, drums, various types of spent carbon adsorption vessels, and other portable vessels, must meet the performance standards for containers in 40 CFR §264.1086 when managing Subpart CC regulated hazardous waste.

The general requirements for containers are as follows:

A. Containers with a design capacity less than or equal to 26.4 gallons are exempt from Subpart CC requirements. 40 CFR §264.1080(b)(2).

B. Containers with a design capacity greater than 26.4 gallons and no more than 119 gallons are subject to Level 1 controls.

C. Containers with a design capacity of greater than 119 gallons that are not in light material service are subject to Level 1 controls.

D. Containers with a design capacity of greater than 119 gallons that are in light material service are subject to Level 2 controls.

E. Containers with a design capacity of greater than 26.4 gallons that are used for treatment of a hazardous waste by a waste stabilization process are subject to Level 3 controls. The Facility does not treat hazardous waste in containers using a waste stabilization process and therefore Level 3 controls are not further discussed.

In light material service is defined as managing a material for which both of the following conditions apply: (i) the vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kPa at 20° C; and (ii) the total concentration of the pure organic constituents having a vapor pressure great than 0.3 kPa at 20° C is equal to or greater than 20 percent by weight. See 40 CFR §264.1081 and §265.1081.

Containers - Level 1 Controls

For containers subject to Level 1 controls, the Facility complies with Subpart CC as follows:

A. All Level 1 containers are subject to the following requirements:

(i) Level 1 containers must be compliant with US DOT hazardous material packaging requirements - i.e., these containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)); or

(ii) Level 1 containers must be equipped with a cover and closure devices that form a continuous barrier such that there are no visible holes, gaps or other open spaces.

B. All containers are inspected upon receipt (on or before the date of acceptance at the Facility, and repairs are conducted where defects are observed, as follows:

(i) visual inspections are conducted to ensure the containers are equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in a closed position there are no visible cracks, holes, gaps or other open spaces into the interior of the containers. 40 CFR §264.1086(c)(1)(ii) and 264.1086(c)(4)(i); and

(ii) visual inspections also confirm that the containers meet the applicable US DOT requirements on packaging hazardous materials for transportation in 49 CFR Parts 107, 172, 173, 178, and 180. 40 CFR §264.1086(d)(i) and 1086(f) see 40 CFR §264.1086(c)(1)(i)); and

(iii) where defects in containers are detected, the Facility makes first attempts to repair no later than 24 hours from detection and completes repair with as soon as possible and in any event within 5 calendar days, or alternatively transfers the waste to an intact container or tank.

C. Where containers are initially placed in service at the Facility, the inspection occurs when the cover is applied to the container. If containers were to remain in use at the Facility for a period of one year or more, the Facility would conduct a visual inspection at least once every 12 months as discussed in item A above. (Since storage of hazardous waste is currently prohibited for more than one year under the RCRA permit, these inspections are not anticipated.) See 40 CFR §264.1086(c)(4)(ii).

D. The facility's operating practice is to only open containers subject to Level 1 controls for the following reasons:

(i) to remove wastes in a continuous process until the container is RCRA empty (40 CFR §261.7(b)); or to remove waste in batches, in which case containers are closed upon completion of the batch removal for 15 minutes or if the operator leaves the immediate vicinity;

(ii) to perform routine activities other than waste transfer, provided that the containers are promptly closed; and

(iii) to open a safety device to avoid an unsafe condition.

Containers - Level 2 Controls

For containers subject to Level 2 controls, the Facility complies with Subpart CC as follows:

A. All Level 2 containers are subject to the following requirements:

(i) Level 2 containers must be compliant with US DOT hazardous material packaging requirements - i.e., containers meet the requirements of 49 CFR Parts 178 and 179, and waste is managed in accordance with 49 CFR Parts 107 (subpart B), 172, 173 and 180 (no exceptions to 178 or 179 are allowed for this purpose) (see 40 CFR §264.1086(f)); or

(ii) Level 2 containers must be tested upon receipt to confirm that they operate with no detectable organic emissions as determined though Method 21.

B. All containers are inspected upon receipt (on or before the date of acceptance at the Facility), and repairs are conducted where defects are observed, as follows:

(i) visual inspections confirm that the containers are equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in a closed position there are no visible cracks, holes, gaps or other open spaces into the interior of the containers. 40 CFR §264.1086(d)(4)(i);

(ii) visual inspections also confirm that the containers meet the applicable US DOT requirements on packaging hazardous materials for transportation in 49 CFR Parts 107, 172, 173, 178, and 180. 40 CFR §264.1086(d)(i) and 1086(f); and

(iii) where defects in containers are detected, the facility makes first attempts to repair no later than 24 hours from detection and completes repair with as soon as possible and in any event within 5 calendar days, or alternatively transfers the waste to an intact container or tank. 40 CFR §264.1086(d)(4)(iii).

C. Where a container is initially placed in service at the facility, the inspection occurs when the cover is applied to the container. 61 Fed. Reg. 59947. If containers remain in use at the facility for a period of one year or more, the facility conducts a visual inspection at least once every 12 months as discussed in item B above. (Since storage of hazardous waste is currently prohibited for more than one year under the RCRA permit, these annual inspections are not anticipated.) 40 CFR §264.1086(d)(4)(ii).

D. All transfers of hazardous waste subject to Subpart CC out of a container is conducted to minimize exposure of the waste to the atmosphere, to the extent practical, considering the physical properties of the waste and good engineering and safety practices for handling the wastes.

Container Recordkeeping

Level 1 and Level 2 containers are subject to limited recordkeeping requirements under Subpart CC. The facility's Waste Tally sheet is used to document that the containers meet USDOT and visual inspection requirements.

4.3 Waste Management Units Exempt from Subpart CC Control Requirements

As summarized in Section 4.1, Tanks T-11 and T-19 are exempt from Subpart CC based on the tank's status as part of an exempt wastewater treatment unit (Tank T-11) and/or the concentration of the VO in the materials introduced to the tank (Tank T-19). With respect to Tank T-19, operator knowledge forms the basis for this exemption. If Evoqua is required to test waste streams to determine their VO concentration, the procedures set forth below apply.

The facility must review, and as necessary, update its VO determinations every 12 months (§264.1082(c)(1)). If the facility determines that sampling is required to update its determination, sampling would be performed in accordance with §§264.1083(a)(2) which is briefly summarized below:

- Identify and record the point of origination for the hazardous waste (§265.1084(a)(3), as referenced by §264.1083).

- Perform sampling pursuant to a sampling plan, and meet the following requirements:
  - Identification of where in the process the samples are to be taken.
  - The appropriate averaging period to be used to determine the average VO concentration in the sample. The averaging period cannot exceed one (1) year. Record the date, time and location that each sample is collected and maintain these data in the Subpart CC sampling plan.
  - The sample collection method used to minimize volatilization of organic compounds contained in the sample. At least four (4) samples are required to calculate the average volatile organic concentration.
  - The analytic methods used to determine concentrations of volatile organic compounds. Acceptable analytic methods include: Method 25D, Methods 8260(latest version) and 8270 (latest version) as defined in SW-846, Methods 624, 625, 1624 and 1625 as defined in 40 CFR Part 136. If any method aside from Method 25D is used, the facility must demonstrate that all target compounds in the sample are included amount those compounds listed by the EPA as ones for which the method is considered appropriate. If target compounds are not on this list, additional requirements will apply to the analytic methods (see §264.1083(a)(2). The sampling plan must include a quality assurance plan to document the specific procedures used to minimize loss of VO compounds due to volatilization, reaction, biodegradation, or sorption during the sample collection, storage, and preparation steps, and a measurement of the overall accuracy and precision of the specific procedures. Further, if analytic methods other than Method 25D are used, the facility may exclude those organics with a Henry's Law constant values less than 0.1 mole-fraction-in-the-gas-phase/mole-faction-in-the-liquid-phase. A list of all such compounds is included in Appendix VI to the final Subpart CC regulations.

A sampling plan is provided in Appendix A. Laboratory Standard Operating Procedures (SOPs) for the analytical methods are maintained onsite with the Facility's Subpart CC Compliance Plan. A list of these SOPs are provided in Appendix B.

## 4.4 Monitoring Requirements

The facility must perform the following monitoring of its operations:

- Assure that the facility complies with all applicable requirements as defined in the

Benzene Waste Operations NESHAP - Subpart FF.

- Review the waste determination for Tank T-19 on an annual basis, no later than December 4 of each calendar year (see §264.1082(c)(1)).

This section must be updated should either the exemption status of T-11 and/or T-19 change or if the applicability determinations for Subpart FF are modified.

## 4.5 Record Keeping Requirements

The facility must maintain the following records as part of the Subpart CC Plan:

- Maintain any sampling data for VO concentration determinations (see §264.1089(f)(1).

- Maintain container inspection records as described in Section 4.2.

This section must be updated should either the exemption status of T-11 and/or T-19 change or if the applicability determinations for Subpart FF be modified. As noted above, records related to any deferral or exemption from Subpart CC due to compliance with Subpart FF are maintained onsite, as per 40 CFR §§264.1089(a) and (j).

## 4.6 Reporting Requirements

Under the final regulations promulgated on November 25, 1996, Subpart CC applicability was amended to exempt any hazardous waste management unit that the facility certifies is equipped with and operating air emission controls in accordance with the Benzene Waste Operations NESHAP (Subpart FF). The notification and reporting provisions included in the final Subpart CC regulations do not specifically require that the facility send such a certification to the U.S. EPA (see §264.1090). However, to assure compliance with this revised applicability standard, the facility has made this certification in letter to the U.S. EPA, Region IX. A copy of this letter is attached at Appendix C.

40 CFR §264.1090 outlines the reporting requirements applicable to RCRA permitted facilities. Reports are required to the EPA when:

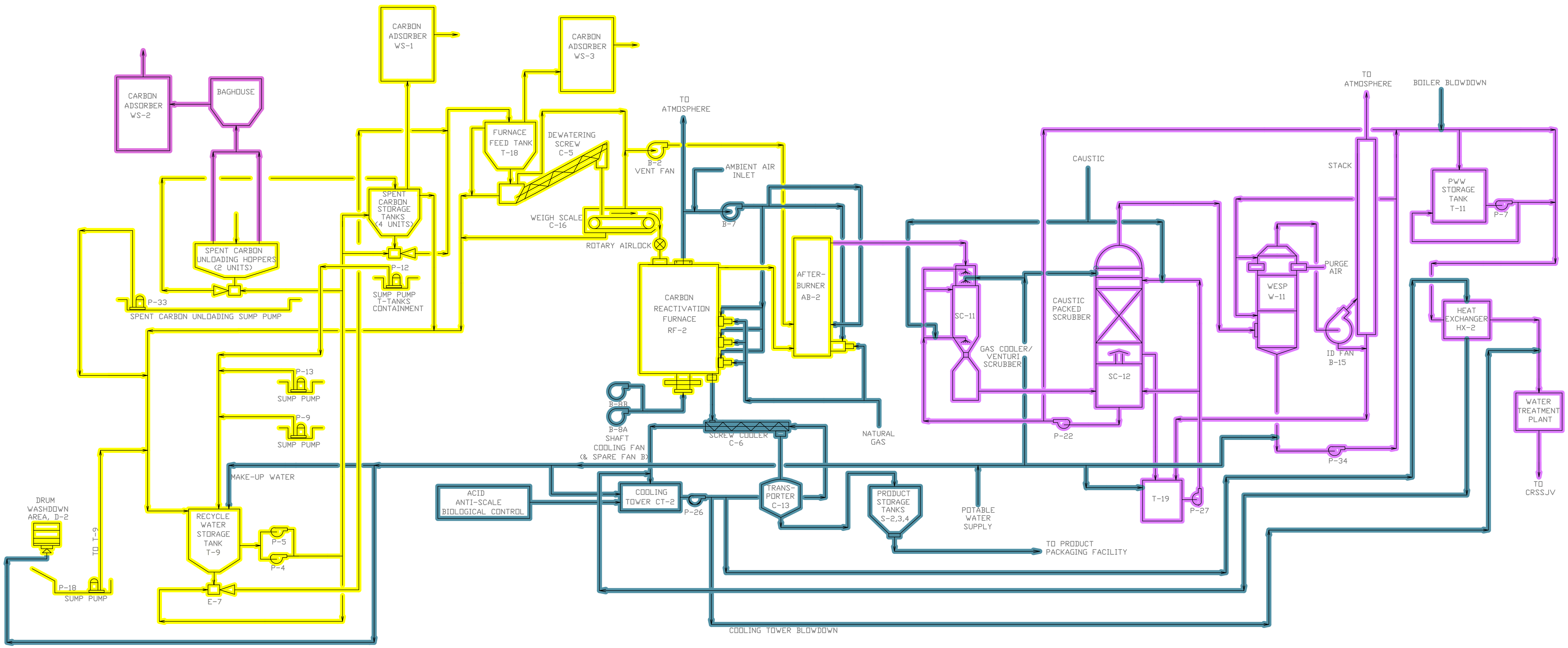
1. A waste management unit reported to be exempt from the Subpart CC regulations that is no longer complying with the standard that exempted the unit (e.g., waste management unit that triggers applicability based on VO concentration).

2. A tank using Tank Level 1 air emission controls that is no longer complying with Level 1

control requirements; and

3. A control device subject to Subpart CC that has continuously operated in noncompliance with the applicable Subpart CC standards for a period of 24 hours or longer in any 6-month period.

The only reporting requirement that may be applicable to the facility would be Item 1. Reporting to EPA would occur if annual VO concentration determination demonstrated that the facility tanks T-11 and/or T-19 noted above were no longer exempt from the standards. These reports would be made within 15 days of becoming aware of the non-exemption status of the equipment.




SUBJECT TO NESHAP SUBPART FF

EXEMPT FROM SUBPARTS BB, CC, AND FF (SEE COMPLIANCE PLANS FOR BASES)

NOT SUBJECT TO SUBPARTS BB & CC (DOES NOT COME IN CONTACT WITH HAZARDOUS WASTE)



| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 0 | KAC | ATH | | UPDATED FROM PC-1466 PR-003 | 3-5-19 |

CBE CHAVOND-BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

PROCESS FLOW DIAGRAM
SUBPARTS BB, CC, AND FF APPLICABILITY

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 1/10/01 | KEM | 1/18/07 | | |

| SCALE | DWG. NO. | REV. |
|---|---|---|
| NONE | FIGURE 1 | 0 |

PRINT DATE: 3/7/19

Appendix A
Facility Sampling Plan

# CHAPTER FOUR

## ORGANIC ANALYTES

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in this chapter is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the data quality objectives (DQOs) or needs for the intended use of the data.

### 4.1 SAMPLING CONSIDERATIONS

#### 4.1.1 Introduction

Following the initial and critical step of designing a sampling plan (Chapter Nine) is the implementation of that plan such that a representative sample of the solid waste (or other material) is collected. Once the sample has been collected it must be stored and preserved to maintain the chemical and physical properties that it possessed at the time of collection. The sample matrix, type of containers and their preparation, analytes of interest, preservation techniques, and sample holding times must be thoroughly examined in order to maintain the integrity of the samples. This section highlights practices relevant to maintaining sample integrity and representativeness from the time of sampling until analysis is complete. This section is, however, applicable primarily to trace analyses. Some of these considerations may be less relevant for source level samples.

#### 4.1.2 Sample Handling and Preservation: General Considerations

This following sections deal separately with volatile organic chemicals (VOCs) and semivolatile organic chemicals (SVOCs). Refer to Chapter Two and Table 4-1 of this section for recommended sample containers, sample preservation, and holding time information. The guidelines in Table 4-1 are intended to improve chemical stability in the sample matrix between the time of sample collection and laboratory preparation/analysis by minimizing loss of the analytes of interest from the sample container and limiting biological and/or chemical degradation (e.g., hydrolysis) (Sec. 4.6 Refs 1, 3-6). Sample preservation recommendations for analysis of organic chemicals almost always include refrigeration or freezing and may also include chemical preservation (e.g., addition of pH modifier). Improper handling, preservation, and storage of samples can negatively impact the representativeness of the field sample data.

The preservation and holding time information presented in Table 4-1 does not represent EPA requirements, but rather is intended solely as guidance. Selection of preservation techniques and applicable holding times should be based on all available information, including the properties of the analytes of interest for the project, their anticipated concentration levels, the composition of the sample matrix itself, and the stated project-specific DQOs. A shorter holding time may be appropriate if the analytes of interest are reactive (e.g., 2-chloroethyl vinyl ether, acrylamide) or the sample matrix is complex (e.g., wastewater). Conversely, a longer holding time may be appropriate if it can be demonstrated that the analytes of interest are not adversely affected from preservation, storage and analyses performed outside the recommended holding times. Prior to collecting samples for analysis, the project team may consider existing information and data regarding analyte stability or conduct field screening for the samples to be collected in order to determine how best to preserve sample integrity for the analytes of interest. The use of site-specific performance evaluation material is a high confidence mechanism to ensure reliability of project data. The references in Sec. 4.6 provide examples of study designs that may be useful for this purpose.

4.1.3 Sample Handling and Preservation for Volatile Organics

4.1.3.1 VOC Sample Containers

The containers used for collecting VOC samples are frequently volatile organics analysis (VOA) vials that are directly compatible with the equipment used for sample preparation and analysis in the laboratory. Use of these containers for sampling helps minimize loss of VOCs resulting from opening sample containers and/or transferring materials from one container to another. Certified pre-cleaned VOA vials are commonly used as sample containers for VOCs and are commercially available from a number of vendors. The vials should be absent of burrs around the caps that might prevent the vial from sealing, and septa should be lined with a polytetrafluoroethylene (PTFE) layer of sufficient thickness to limit diffusion of VOCs out of the vials during storage. PTFE thicknesses of 0.13 to 0.25 mm have been shown to be effective. See reference # 18 in Sec. 4.6 below and Sec. A.8 in Method 5035A for more detail. If they are suspected of being a source of interferences, VOA vials and unpunctured septa should be washed with soap and water and rinsed with distilled de-ionized water. After thoroughly cleaning the vials and septa, they should be placed in an oven and dried at 100 °C for approximately one hour.

<u>NOTE</u>: Heating the septa for extended periods of time (i.e., more than one hour) or at higher temperatures should be avoided, because the silicone begins to slowly degrade at 105 °C). Also, punctured silicone-backed PTFE-lined septa should generally not be reused, because some VOCs have high affinity for the silicone material, and puncturing the PTFE septum face exposes the gas phase vial contents to the silicone backing material, causing loss of certain VOCs depending on length of exposure time and vial temperature.

Air-tight, sealable coring devices (e.g., En Core™, Core N' One™ or equivalent) may also be useful for collection and storage of cohesive soil samples for VOC analysis. These devices are designed to limit loss of VOCs from samples during cold storage and shipping over a limited time frame and for quantitative transfer of solids and associated VOCs into VOA vials for immediate analysis or further preservation. Their use during field sampling of solids helps reduce or eliminate the need to handle solvents or chemical preservatives in the field and eliminates some shipping restrictions on field samples that may otherwise contain flammable solvents (e.g., methanol). Additional information regarding stability studies of VOCs in solid materials stored in sealable coring devices is contained in the Sec. A.7 of the appendix of Method 5035A and is described in more detail in the sources referenced therein. An American Society for Testing and Materials (ASTM) standard practice for use of the En Core™ type samplers is also included in the references in Sec. 4.6 below.

4.1.3.2 VOC Sample Collection:

When transferring samples into vials, liquids and solids should be introduced gently to minimize agitation which might drive off volatile compounds.

At least two replicate VOA vials should be collected and labeled immediately for each collected field sample. They should not be filled near a running motor or any type of exhaust system because discharged fumes and vapors may contaminate the samples. Replicate vials from a single sampling point may be sealed together in a single plastic bag, but different samples should be segregated into separate plastic bags to prevent contamination of samples with little to no VOCs from those with high concentrations. Sample containers may also become contaminated by diffusion of VOCs into the vials through the septa from the surrounding environment during shipment and storage. To monitor for this potential source of contamination, a trip blank prepared from organic-free reagent water (as defined in Chapter One) should be maintained with the samples throughout sampling, shipping, and storage. Including activated carbon in the bags containing the sample vials may help reduce concerns related to these potential sources of sample contamination.

Improper vial sealing (e.g., due to solids retained on the vial threads) and improper tightening of caps or closing of sealable coring devices are primary factors in the loss of volatiles due to sample collection activities. Sealing surfaces and any closure threads should be inspected to ensure they are free of debris prior to container closure.

Procedures should also be established for selection and appropriate use of sample collection devices (i.e., bailer, coring tool, etc.) including appropriate decontamination measures. If the sample comes in contact with the sampling device, organic free reagent water may be run through the device and tested as a field blank.

In general, liquid samples should be poured into vials without introducing any air bubbles into the samples as vials are filled. Should bubbling occur as a result of violent pouring, the sample should be poured out and the vial refilled. The vials should be completely filled at the time of sampling, so that when the septum cap is fitted and sealed and the vial is inverted, no headspace is visible. The sample should be hermetically sealed in the vial at the time of sampling, and not opened prior to analysis to preserve its integrity.

4.1.3.3 VOC Sample Preservation and Holding Times:

Samples containing analytes that can be subject to biological degradation need to be preserved as soon as possible (preferably in the field) to avoid the loss of target analytes. Refrigeration or freezing is a primary means of sample preservation, because rates of biotic and abiotic degradation decrease with decreasing temperature, and VOCs are also less volatile at lower temperature. Samples containing analytes that are most subject to biological degradation (e.g., aromatic hydrocarbons) also should be chemically preserved (e.g., by addition of acid), unless they are analyzed immediately. Chemical preservation may be inappropriate for highly reactive compounds (e.g., 2-chloroethyl vinyl ether, acrylamide, etc.), since it may accelerate loss by rapid chemical reaction. Aqueous samples containing free chlorine should also be preserved with a dechlorinating agent in order to minimize formation of trihalomethanes and other possible chemical reactions.

Although VOC samples may be held for up to 7 days unpreserved or 14 days or longer preserved, it is generally not recommended as good laboratory practice to hold them that long. VOC samples should be run as soon as possible after receipt by the laboratory. Samples in which highly reactive compounds (e.g., 2-chloroethyl vinyl ether, acrylamide, etc.) are analytes of interest should be analyzed as soon as they are received in the laboratory.

4.1.4 Sample Handling and Preservation for Semivolatile Organics, Including Pesticides, PCBs and Herbicides

4.1.4.1 Sample Containers for Analysis of Semivolatile Organics

The containers specified for samples intended for analysis of SVOCs are typically constructed of glass with PTFE-lined threaded caps. In situations where PTFE liners are not available, solvent-rinsed aluminum foil may be used as a liner. However, acidic or basic samples may react with the aluminum foil, causing eventual contamination of the sample. Use of new, disposable pre-cleaned and certified containers reduces concerns about contamination from reusing sample containers. Plastic containers or plastic lids without PTFE liners should not be used for storage of samples due to potential contamination by phthalate esters and other hydrocarbons within the plastic or absorption of any chemicals of concern in the native sample into the container material. If sample containers are suspected of being a source of interferences, particularly for low-level analysis, they should be soap and water washed followed by rinsing with solvent(s) appropriate for the analytes of interest. (See Sec. 4.1.6 for specific instructions on glassware cleaning.). Caps may be cleaned by solvent rinsing or replaced with new ones. Monitoring for contamination introduced from sample containers should be accomplished through preparation and analysis of a method blank.

4.1.4.2 Sample Collection for SVOCs

Sample containers should be filled with care so as to prevent any portion of the collected samples from coming in contact with the sampler's gloves, potentially leading to sample contamination. Samples should not be collected or stored in the presence of exhaust fumes. If the sample comes in contact with the sampling device, run organic-free reagent water through the sampling device and test this water as a field blank.

4.1.4.3 Sample Preservation and Holding Times for SVOCs

Field samples to be analyzed for SVOCs are typically preserved by refrigeration or freezing. In order to minimize opportunities for the most labile SVOCs to degrade, these samples are typically recommended to be solvent extracted shortly after being taken, within 7-14 days for many classes of chemicals. However, some classes of SVOCs, like polychlorinated biphenyls and polychlorinated dibenzodioxins and dibenzofurans are very recalcitrant and do not readily degrade during refrigerated storage. Sample matrices to be analyzed for these SVOCs have no maximum recommended holding time. Depending on the composition of the sample matrix and the levels of concern for the target analytes, other classes of SVOCs (e.g., polycyclic aromatic hydrocarbons [PAHs]) may also be stable in refrigerated or frozen storage for longer than the maximum holding time recommended in Table 4-1 (see Reference #12 in Sec. 4.6 below). However, the composition of the sample matrix can be an important determinant of chemical stability, and minimizing the holding time between sampling and solvent extraction is generally a good practice to obtain representative data.

Solvent extracts of samples should be carefully maintained. Solvent extraction generally stabilizes SVOCs, because the chemicals are typically physically removed from the sample matrix, and some loss mechanisms are eliminated (i.e., biological degradation). Holding times of 40 days are recommended for solvent extracts for most classes of SVOCs. Many analytes of interest may be stable in solvent for a longer time period even in extracts of complex matrices, but problems maintaining small volumes of very volatile solvent extracts preclude storage of extracts indefinitely, and some SVOCs may still chemically degrade or may be slightly volatile in certain solvents.

Freezing solvent extracts particularly of complex sample matrices may cause precipitation of solids resulting from interaction of some co-extracted sample matrix components. Storing extracts at 0 to 6 $^{o}$C may limit problems resulting from analyzing extracts containing precipitated solids, like contaminating or clogging the injector syringe or introducing insoluble components into the flow pathway of the mobile phase. One way to remove precipitated solids from a solvent extract is by filtration with a sub-micron particle size filter made of inert material (e.g., PTFE). As with other preparation steps, batch quality control (QC) samples should be subjected to the same filtration procedure as the field samples in order to assess the cumulative impact of all sample preparation steps on analyte recovery and evaluate the potential for contamination resulting from all reagents, and other materials that come into contact with the samples.

#### 4.1.5 Safety

The methods listed in this chapter do not address all safety issues associated with their use. The laboratory is responsible for maintaining a safe work environment and a current awareness file of OSHA regulations regarding the safe handling of the chemicals used in these methods. A reference file of material safety data sheets (MSDSs) and/or safety data sheets (SDSs) should be available to all personnel involved in these analyses.

Safety should always be the primary consideration in the collection and analysis of samples. A thorough understanding of the waste production process, as well as all of the potential hazards of the waste itself, should be investigated whenever possible. The site should be evaluated just prior to sampling to determine whether any additional safety measures are necessary. Minimum protection of gloves and safety glasses should be worn to prevent sample contact with the skin and eyes. A respirator should be worn even when working outdoors if organic vapors are present. More hazardous sampling missions may require the use of supplied air and special clothing.

### 4.1.6 Cleaning of Reusable Glassware

In order to successfully analyze samples containing components in the parts per billion or lower concentration range, the preparation of scrupulously clean glassware is necessary. Failure to do so can lead to a myriad of problems interpreting data due to the presence of interferences resulting from contamination. Particular care must be taken with glassware such as Soxhlet extractors, Kuderna-Danish evaporative concentrators, sampling-train components, or any other glassware that comes into contact with an extract, particularly if the extract will be evaporated to a smaller volume. The process of concentrating the compounds of interest in this operation may similarly concentrate the contaminating substance(s), which may distort the results and complicate data interpretation.

The basic cleaning steps are:

1. Removal of surface residuals immediately after use

2. Hot soak to loosen and float most particulate material

3. Hot water rinse to flush away floated particulates

4. Soak with an oxidizing agent to destroy traces of organic compounds

5. Hot water rinse to flush away materials loosened by the deep penetrant soak

6. Distilled water rinse to remove metallic deposits from the tap water
7. Alcohol (e.g., isopropanol or methanol) rinse to flush off any final traces of organic materials and remove the water

8. Flushing the item immediately before use with some of the same solvent that will be used in the analysis

Comments regarding each of the eight fundamental steps are discussed here in the order in which they appeared above:

Step 1: As soon as analysis is complete, the glassware (e.g., beakers, pipettes, flasks, or bottles) that came into contact with samples or standards should be flushed with water and then alcohol or other appropriate solvent before it is placed in the hot detergent soak. Otherwise, the soak bath may serve to contaminate all other glassware placed therein.

Step 2: The hot soak consists of a bath of a suitable detergent in water at 50 °C or higher. The detergent, powder or liquid, should be entirely synthetic and not a fatty acid base. There are very few areas of the country where the water hardness is sufficiently low to avoid formation of some hard-water scum resulting from the reaction between calcium and magnesium salts with a fatty acid soap. This hard-water scum or curd would have an affinity particularly for many chlorinated compounds and, being almost wholly water-insoluble, would deposit on all glassware in the bath in a thin film.

There are many suitable detergents on the wholesale and retail market. Most of the common liquid dishwashing detergents sold at retail are satisfactory but are more expensive than other comparable products sold industrially. Alconox, in powder or tablet form, is manufactured by Alconox, Inc., New York, and is marketed by a number of laboratory supply firms. Sparkleen, another powdered product, is distributed by Fisher Scientific Company.

Step 3: No comments

Step 4: **Chromic acid should not be used to clean glassware.** Commercial, non-chromate products (e.g., Nochromix) may be used in place of chromic acid, if adequate cleaning is documented by an analytical quality assurance (QA) program. Chromic acid should also not be used with plastic bottles.

The potential hazards of using chromic-sulfuric acid mixture are great and have been well publicized. There are now commercially available substitutes that possess the advantage of safety in handling. These are biodegradable concentrates with a claimed cleaning strength equal to the chromic acid solution. They are alkaline, equivalent to roughly 0.1 N NaOH upon dilution, and are claimed to remove dried blood, silicone greases, distillation residues, insoluble organic residues, etc. They are further claimed to remove radioactive traces and will not attack glass or exert a corrosive effect on skin or clothing. One such product is "Chem Solv 2157," manufactured by Mallinckrodt and available through laboratory supply firms. Another comparable product is "Detex," a product of Borer-Chemie, Solothurn, Switzerland. Other similarly effective products are Nochromix (Godax Laboratories) and Contrad 70 (Decon Labs).

Steps 5, 6, and 7: No comments

Step 8: There is always a possibility that between the time of washing and the next use, the glassware could pick up some contamination from either the air or direct contact. To prevent this, it is good practice to flush the item immediately before use with some of the same solvent that will be used in the analysis.

The drying and storage of the cleaned glassware is of critical importance to realize the benefit of scrupulous cleaning. Pegboard drying is not recommended. It is recommended that laboratory glassware and equipment be dried at 100 °C. Under no circumstances should such small items be left in the open without protective covering. Otherwise, dust and soot in a laboratory environment can re-contaminate the clean glassware.

As an alternative to solvent rinsing, glassware may be heated to a minimum of 300 °C for sufficient time to vaporize any residual organic chemicals. Glassware should be allowed to cool fully before use. This high temperature treatment should not be used on volumetric glassware, glassware with ground glass joints, or sintered glassware.

#### 4.1.7 High concentration samples

Cross contamination of trace concentration samples may occur when prepared in the same laboratory with high concentration samples. Ideally, if both type samples are being handled, a laboratory and glassware dedicated solely to the preparation of high concentration samples would be available for this purpose. If this is not feasible, at a minimum, disposable glassware or glassware dedicated solely to the preparation of high concentration samples should be used. Avoid cleaning glassware used for both trace and high concentration samples in the same area.

TABLE 4-1
RECOMMENDED SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES[a]
(Note: Footnotes are located on the last page of the table.)

VOLATILE ORGANICS

| Sample Matrix | Container[1] | Preservative[2] | Holding Time[3] |
|---|---|---|---|
| Concentrated waste samples | Method 5035: See the method.<br>Method 5021: See the method.<br>Methods 5031 and 5032: See the methods.<br><br>Use PTFE-lined lids for all procedures. | Cool to 0 - 6 °C. | 14 days |
| Aqueous samples with no residual chlorine present | Methods 5021, 5030, 5031, and 5032:<br><br>3 x 40-mL vials with PTFE-lined septum caps | Cool to 0 - 6°C and adjust pH to less than 2 with $H_2SO_4$, HCl, or solid $NaHSO_4$ | 14 days |
| | | If carbonaceous materials are present, or if MTBE and other fuel oxygenate ethers are present and a high temperature sample preparative method is to be used, do not acid preserve the samples. | *7 days* |
| | | If compounds that readily degrade in acidified water (e.g., 2-chloroethyl vinyl ether[b]) are analytes of interest, collect a second set of samples without acid preservatives and analyze as soon as possible. | *7 days* |

TABLE 4-1 (continued)
RECOMMENDED SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES[a]

VOLATILE ORGANICS (continued)

| Sample Matrix | Container[1] | Preservative[2] | Holding Time[3] |
|---|---|---|---|
| Aqueous samples WITH residual chlorine present | Methods 5021, 5030, 5031, and 5032:<br>3 x 40-mL vials with PTFE-lined septum caps | Collect sample in a 125-mL container which has been pre-preserved with 4 drops of 10% sodium thiosulfate solution. Gently swirl to mix sample and transfer to a 40-mL VOA vial. Cool to 0 - 6 °C and adjust pH to less than 2 with $H_2SO_4$, HCl, or solid $NaHSO_4$. | 14 days |
| | | If carbonaceous materials are present, or if MTBE and other fuel oxygenate ethers are present and a high temperature sample preparative method is to be used, do not acid preserve the samples. | *7 days* |
| | | If compounds that readily degrade in acidified water (e.g., 2-chloroethyl vinyl ether[b]) are analytes of interest, collect a second set of samples without acid preservatives and analyze as soon as possible. | *7 days* |
| Acrolein and Acrylonitrile<br>Aqueous samples | Methods 5021, 5030, 5031, and 5032:<br>3 x 40-ml vials with PTFE-lined septum caps | Adjust to pH 4 - 5. Cool to 0 - 6 °C.<br>These compounds are highly reactive and should be analyzed as soon as possible. | 7 days |
| Solid samples (e.g., soils, sediments, sludges, ash) | Method 5035: See the method.<br>Method 5021: See the method.<br>Methods 5031 and 5032: See the methods. | See the individual methods. | 14 days |
| | | If compounds that may be reactive in acidified soils (e.g., vinyl chloride, styrene, 2-chloroethyl vinyl ether) are analytes of interest, collect a second set of samples without acid preservatives and analyze as soon as possible. | 7 days |

TABLE 4-1 (continued)
RECOMMENDED SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES[a]

SEMIVOLATILE ORGANICS/ORGANOCHLORINE PESTICIDES AND HERBICIDES

| Sample Matrix | Container[1] | Preservative[2] | Holding Time[3] |
|---|---|---|---|
| Concentrated waste samples | 125-mL wide-mouth glass with PTFE-lined lid | Cool to 0 - 6 °C. | Samples extracted within 14 days and extracts analyzed within 40 days following extraction. |
| Aqueous samples with no residual chlorine present | 4 x 1-L amber glass container with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis. | Cool to 0 - 6 °C. | Samples extracted within 7 days and extracts analyzed within 40 days following extraction. |
| Aqueous samples WITH residual chlorine present | 4 x 1-L amber glass container with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis. | Add 3 mL 10% sodium thiosulfate solution per gallon (or 0.008%). Addition of sodium thiosulfate solution to sample container may be performed in the laboratory prior to field use. Cool to 0 - 6 °C. | Samples extracted within 7 days and extracts analyzed within 40 days following extraction. |
| Solid samples (e.g., soils, sediments, sludges, ash) | 250-mL wide-mouth glass container with PTFE-lined lid | Cool to 0 - 6 °C. | Samples extracted within 14 days and extracts analyzed within 40 days following extraction. |

TABLE 4-1 (continued)
RECOMMENDED SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES[a]

POLYCHLORINATED BIPHENYLS, POLYCHLORINATED DIBENZO-*p*-DIOXINS, AND POLYCHLORINATED DIBENZOFURANS

| Sample Matrix | Container[1] | Preservative[2] | Holding Time[3] |
|---|---|---|---|
| Concentrated waste samples | 125-mL wide-mouth glass with PTFE-lined lid | None | None |
| Aqueous samples with no residual chlorine present | 4 x 1-L amber glass container with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis. | Cool to 0 - 6 °C. | None |
| Aqueous samples WITH residual chlorine present | 4 x 1-L amber glass container with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis. | Add 3 mL 10% sodium thiosulfate solution per gallon (or 0.008%). Addition of sodium thiosulfate solution to sample container may be performed in the laboratory prior to field use.<br><br>Cool to 0 - 6 °C | None |
| Solid samples (e.g., soils, sediments, sludges, ash) | 250-mL wide-mouth glass container with PTFE-lined lid. | Cool to 0 - 6 °C. | None |

[a] The information presented in this table does not represent EPA requirements, but rather it is intended solely as guidance. Selection of containers, preservation techniques and applicable holding times should be based on the stated project-specific DQOs.

[b] See References 1-10 for the preservation and holding times studies for volatile organics. It is the intention of the Agency that separate unpreserved vials be collected when 2-chloroethylvinyl ether is an analyte of interest.

[1] PTFE-lined caps are acceptable for all recommended container types. Additional replicate sample containers should also be collected to perform all necessary laboratory QC (e.g., duplicate, matrix spike / matrix spike duplicate QC samples).

[2] The exact sample, extract, and standard storage temperature should be based on project-specific requirements and/or manufacturer's recommendations for commercially available standards. Furthermore, alternative storage temperatures may be appropriate based on demonstrated analyte stability in a given matrix, provided the stated DQOs for a project-specific application are still attainable.

[3] A longer holding time may be appropriate if it can be demonstrated that the reported analyte concentrations are not adversely affected from preservation, storage and analyses performed outside the recommended holding times.

## 4.2 SAMPLE PREPARATION METHODS

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

### 4.2.1 Extractions and preparations

The following methods are included in this section:

| | |
|---|---|
| **Method 3500C:** | Organic Extraction and Sample Preparation |
| **Method 3510C:** | Separatory Funnel Liquid-Liquid Extraction |
| **Method 3511**: | Organic Compounds in Water by Microextraction |
| **Method 3520C:** | Continuous Liquid-Liquid Extraction |
| **Method 3535A:** | Solid-Phase Extraction (SPE) |
| **Method 3540C:** | Soxhlet Extraction |
| **Method 3541:** | Automated Soxhlet Extraction |
| **Method 3542:** | Extraction of Semivolatile Analytes Collected Using Method 0010 (Modified Method 5 Sampling Train) |
| **Method 3545A:** | Pressurized Fluid Extraction (PFE) |
| **Method 3546:** | Microwave Extraction |
| **Method 3550C:** | Ultrasonic Extraction |
| **Method 3560:** | Supercritical Fluid Extraction of Total Recoverable Petroleum Hydrocarbons |
| **Method 3561:** | Supercritical Fluid Extraction of Polynuclear Aromatic Hydrocarbons |
| **Method 3562:** | Supercritical Fluid Extraction of Polychlorinated Biphenyls (PCBs) and Organochlorine Pesticides |
| **Method 3570**: | Microscale Solvent Extraction (MSE) |
| **Method 3571:** | Extraction of Solid and Aqueous Samples for Chemical Agents |
| **Method 3572:** | Extraction of Wipe Samples for Chemical Agents |
| **Method 3580A:** | Waste Dilution |
| **Method 3585:** | Waste Dilution for Volatile Organics |
| **Method 5000:** | Sample Preparation for Volatile Organic Compounds |
| **Method 5021A:** | Volatile Organic Compounds in Soils and Other Solid Matrices Using Equilibrium Headspace Analysis |
| **Method 5030B:** | Purge-and-Trap for Aqueous Samples |
| **Method 5031:** | Volatile, Non-purgeable, Water-Soluble Compounds by Azeotropic Distillation |
| **Method 5032:** | Volatile Organic Compounds by Vacuum Distillation |
| **Method 5035:** | Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples |
| **Method 5041A:** | Analysis for Desorption of Sorbent Cartridges from Volatile Organic Sampling Train (VOST) |

4.2.2 Cleanup

The following methods are included in this section:

**Method 3600C:** Cleanup
**Method 3610B:** Alumina Cleanup
**Method 3611B:** Alumina Column Cleanup and Separation of Petroleum Wastes
**Method 3620C:** Florisil Cleanup
**Method 3630C:** Silica Gel Cleanup
**Method 3640A:** Gel-Permeation Cleanup
**Method 3650B:** Acid-Base Partition Cleanup
**Method 3660B:** Sulfur Cleanup
**Method 3665A:** Sulfuric Acid/Permanganate Cleanup

## 4.3 DETERMINATION OF ORGANIC ANALYTES

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

4.3.1 Gas chromatographic methods

The following methods are included in this section:

**Method 8000D:** Determinative Chromatographic Separations
**Method 8011:** 1,2-Dibromoethane and 1,2-Dibromo-3-chloropropane by Microextraction and Gas Chromatography
**Method 8015C:** Non-halogenated Organics by Gas Chromatography
**Method 8021B:** Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors
**Method 8031:** Acrylonitrile by Gas Chromatography
**Method 8032A:** Acrylamide by Gas Chromatography
**Method 8033:** Acetonitrile by Gas Chromatography with Nitrogen-Phosphorus Detection
**Method 8041A:** Phenols by Gas Chromatography
**Method 8061A:** Phthalate Esters by Gas Chromatography with Electron Capture Detection (GC/ECD)
**Method 8070A:** Nitrosamines by Gas Chromatography
**Method 8081B:** Organochlorine Pesticides by Gas Chromatography
**Method 8082A:** Polychlorinated Biphenyls (PCBs) by Gas Chromatography

**Method 8085:** Compound-independent Elemental Quantitation of Pesticides by Gas Chromatography with Atomic Emission Detection (GC/AED)
**Method 8091:** Nitroaromatics and Cyclic Ketones by Gas Chromatography
**Method 8095:** Explosives by Gas Chromatography
**Method 8100:** Polynuclear Aromatic Hydrocarbons
**Method 8111:** Haloethers by Gas Chromatography
**Method 8121:** Chlorinated Hydrocarbons by Gas Chromatography: Capillary Column Technique
**Method 8131:** Aniline and Selected Derivatives by Gas Chromatography
**Method 8141B:** Organophosphorus Compounds by Gas Chromatography
**Method 8151A:** Chlorinated Herbicides by GC Using Methylation or Pentafluorobenzylation Derivatization

4.3.2 Gas chromatographic/mass spectrometric methods

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following methods are included in this section:

**Method 8260B:** Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
**Method 8261:** Volatile Organic Compounds by Vacuum Distillation in Combination with Gas Chromatography/Mass Spectrometry (VD/GC/MS)
**Method 8270D:** Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
**Method 8275A:** Semivolatile Organic Compounds (PAHs and PCBs) in Soils/Sludges and Solid Wastes Using Thermal Extraction/Gas Chromatography/Mass Spectrometry (TE/GC/MS)
**Method 8276:** Toxaphene and Toxaphene Congeners by Gas Chromatography/Negative Ion Chemical Ionization Mass Spectrometery (GC-NICI/MS)
**Method 8280B:** Polychlorinated Dibenzo-*p*-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/Low Resolution Mass Spectrometry (HRGC/LRMS)
**Method 8290A:** Polychlorinated Dibenzo-*p*-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS)
**Appendix A:** Procedures for the Collection, Handling,

Analysis and Reporting of Wipe Tests Performed within the Laboratory

4.3.3 High performance liquid chromatographic methods

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following methods are included in this section:

**Method 8310:** Polynuclear Aromatic Hydrocarbons
**Method 8315A:** Determination of Carbonyl Compounds by High Performance Liquid Chromatography (HPLC)
**Appendix A:** Re-crystallization of 2,4-Dinitrophenylhydrazine (DNPH)
**Method 8316:** Acrylamide, Acrylonitrile and Acrolein by High Performance Liquid Chromatography (HPLC)
**Method 8318A:** *N*-Methylcarbamates by High Performance Liquid Chromatography (HPLC)
**Method 8321B:** Solvent-Extractable Nonvolatile Compounds by High-Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection
**Method 8325:** Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Particle Beam/Mass Spectrometry (HPLC/PB/MS)
**Method 8330A:** Nitroaromatics and Nitramines by High Performance Liquid Chromatography (HPLC)
**Method 8331:** Tetrazene by Reverse Phase High Performance Liquid Chromatography (HPLC)
**Method 8332:** Nitroglycerine by High Performance Liquid Chromatography

4.3.4 Infrared methods

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following methods are included in this section:

| | |
|---|---|
| **Method 8410:** | Gas Chromatography/Fourier Transform Infrared (GC/FT-IR) Spectrometry for Semivolatile Organics: Capillary Column |
| **Method 8430:** | Analysis of Bis(2-chloroethyl) Ether and Hydrolysis Products by Direct Aqueous Injection GC/FT-IR |
| **Method 8440:** | Total Recoverable Petroleum Hydrocarbons by Infrared Spectrophotometry |

4.3.5 Miscellaneous spectrometric methods

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following method is included in this section:

| | |
|---|---|
| **Method 8520:** | Continuous Measurement of Formaldehyde in Ambient Air |

## 4.4 IMMUNOASSAY METHODS

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following methods are included in this section:

| | |
|---|---|
| **Method 4000:** | Immunoassay |
| **Method 4010A:** | Screening for Pentachlorophenol by Immunoassay |
| **Method 4015:** | Screening for 2,4-Dichlorophenoxyacetic Acid by Immunoassay |
| **Method 4020:** | Screening for Polychlorinated Biphenyls by Immunoassay |
| **Method 4025:** | Screening for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans (PCDD/Fs) by Immunoassay |
| **Method 4030:** | Soil Screening for Petroleum Hydrocarbons by Immunoassay |
| **Method 4035:** | Soil Screening for Polynuclear Aromatic Hydrocarbons by Immunoassay |
| **Method 4040:** | Soil Screening for Toxaphene by Immunoassay |
| **Method 4041:** | Soil Screening for Chlordane by Immunoassay |
| **Method 4042:** | Soil Screening for DDT by Immunoassay |
| **Method 4050:** | TNT Explosives in Soil by Immunoassay |
| **Method 4051:** | Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in Soil by |

| | |
|---|---|
| | Immunoassay |
| **Method 4425:** | Screening Extracts of Environmental Samples for Planar Organic Compounds (PAHs, PCBs, PCDDs/PCDFs) by a Reporter Gene on a Human Cell Line |
| **Method 4430:** | Screening For Polychlorinated Dibenzo-p-Dioxins And Furans (PCDD/Fs) By Aryl Hydrocarbon-Receptor PCR Assay |
| **Method 4435:** | Method For Toxic Equivalents (TEQS) Determinations For Dioxin-Like Chemical Activity with the CALUX® Bioassay |
| **Method 4670:** | Triazine Herbicides as Atrazine in Water by Quantitative Immunoassay |

## 4.5 MISCELLANEOUS SCREENING METHODS

Prior to employing the methods in this chapter, analysts are advised to consult the disclaimer statement at the front of this manual and the information in Chapter Two for guidance on the allowed flexibility in the choice of apparatus, reagents, and supplies. In addition, unless specified in a regulation, the use of SW-846 methods is not mandatory in response to Federal testing requirements. The information contained in each procedure is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to meet the DQOs or needs for the intended use of the data.

The following methods are included in this section:

| | |
|---|---|
| **Method 3815:** | Screening Solid Samples for Volatile Organics |
| **Method 3820:** | Hexadecane Extraction and Screening of Purgeable Organics |
| **Method 8510:** | Colorimetric Screening Procedure for RDX and HMX in Soil |
| **Method 8515:** | Colorimetric Screening Method for Trinitrotoluene (TNT) in Soil |
| **Method 8535:** | Screening Procedure for Total Volatile Organic Halides in Water |
| **Method 8540:** | Pentachlorophenol by UV-Induced Colorimetry |
| **Method 9074:** | Turbidimetric Screening Method for Total Recoverable Petroleum Hydrocarbons in Soil |
| **Method 9078:** | Screening Test Method for Polychlorinated Biphenyls in Soil |
| **Method 9079:** | Screening Test Method for Polychlorinated Biphenyls in Transformer Oil |

## 4.6 REFERENCES


1. A. B. Dindal, R. A. Jenkins, and C. K. Bayne. "Summary Report - Evaluation of the Impact of Post-Holding Time Analyte Degradation on Regulatory Decision-Making - VOCs in Water," Oak Ridge National Laboratory. 2001.

2. ASTM Standard D4841, 1988 (2008). Standard Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents. ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/D4841-88R08, www.astm.org.

3. J. T. Love, G. C., Deltzer, S. R. Abney, and J. S. Zogorski. "Study Design and Analytical Results Used to Evaluate Stability of Volatile Organic Compounds in Water Matrices." United States Geological Survey Open-File Report 98-637. 1999.

4. M. P. Maskarinec, C. K. Bayne, L. H. Johnson, S. K. Holladay, and R. A. Jenkins. "Stability of Volatile Organics in Environmental Water Samples: Storage and Preservation." Oak Ridge National Laboratory ORNL/TM-11300. 1989.

5. O. R. West, C. K. Bayne, R. L. Siegrist, W. L. Holden, S. S. Scarborough, and D. W. Bottrell. "Stability of VOCs in Water samples During Pre-analytical Holding. Part 1. Analyses by a Commercial Laboratory." Oak Ridge National Laboratory ORNL/TM-13240/V1. 1996.

6. O. R. West, C. K. Bayne, R. L. Siegrist, W. L. Holden, and D. W. Bottrell. "Stability of VOCs in Water samples During Pre-analytical Holding. Part 2. Analyses by an EPA Regional Laboratory." Oak Ridge National Laboratory ORNL/TM-13240/V2. 1997.

7. C. K. Bayne, D. D. Schmoyer, and R. A. Jenkins. "Practical Reporting Times for Environmental Samples." Environmental Science and Technology, 28: 1430-1436.
8. 1994.

9. M. P. Maskarinec, C. K. Bayne, R. A. Jenkins, L. H. Johnson, and S. K. Holladay. "Final Report - Stablity of Volatile Organics in Environmental Soil samples." Oak Ridge National Laboratory ORNL/TM-12128. 1992.

10. Preservation and Holding Times Study for Vinyl Chloride, Styrene in Industrial Wastewater provided by Test America, January 2012.

11. Preservation and Holding Times Study for Vinyl Chloride, Styrene in Municipal Wastewater provided by the Hampton Roads Sanitation District in Virginia Beach, Virginia, January 2012.

12. ASTM Guide D4547, 1991 (2009). Standard Guide for Sampling Waste and Soils for Volatile Organic Compounds. ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/D4547-09, www.astm.org.

13. U.S. Environmental Protection Agency. "Sample Holding Time Re-evaluation." EPA/600/R-05/124. 2005.

14. U.S. Environmental Protection Agency. “Performance of Hydrochloric Acid and Trisodium Phosphate as Preservatives for Selected Organic Compounds in Ground Water.” In: A Guide for Assessing Biodegradation and Source Identification of Organic Ground Water Contaminants using Compound Specific Isotope Analysis, EPA 600/R-08/148. 2008.

15. ASTM Standard Practice D6418, 2003 (2009). Standard Practice for Using the Disposable En Core Sample for Sampling and Storing Soil for Volatile Organic Analysis. ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/D6418-09, www.astm.org.

16. RCRA Organic Methods Workgroup Meeting Minutes, January 19, 2012.

17. RCRA Organic Methods Workgroup Meeting Minutes, January 26, 2012.

18. RCRA Organic Methods Workgroup Meeting Minutes, February 9, 2012.

19. U.S. Environmental Protection Agency. “Integrity of VOA Vial Seals.” EPA/600/R-00/066. 2000.

Appendix A:
Summary of Updates/Changes in Chapter 4

1. The document format was updated to Microsoft Word .docx format.
2. The revision number was changed to five and the date published to July 2014.
3. Various editorial corrections were made throughout Section 4.1 to 4.5 to improve clarity.
4. Table 4-1 was reformatted and updated by removing the recommendation to collect a second set of samples without adding an acid preservative and analyze in a shorter time frame if vinyl chloride and styrene are analytes of concern for aqueous samples.
5. Methods 3511 and 3572 were added to Section 4.2.1. Various Method version letters were updated to the current version.
6. Methods 4025, 4430 and 4435 were added to Section 4.4
7. A references section was added as Section 4.6.

Appendix B

Laboratory Standard Operating Procedures for Analytical Methods

Complete SOP's Maintained Onsite

EPA Methods 5030B, 5030C and 5035 – SOP No. IR-MSV-Prep, Rev 3.1, Effective Date 5/30/2018

EPA Methods 8260B, 624 and TPH, SOP No. IR-MSV-8260_624, Rev 2, Effective Date 03/02/2015

EPA Methods 3510C, 608, 608.3, 3620C, 3630C, 3660B, and 3665A, SOP No. IR-EXT-3510, Rev. 3, Effective Date 09/18/2018

EPA Methods 8015B/8015D, IR-GVC-8015-GRO, Rev. 0.1, Effective Date 02/28/2019

EPA Methods 8270C and 625, SOP No. IR-MSS-8270_625, Rev 3, Effective Date 03/07/2016

EPA Methods 3520C and 625/625.1, SOP No. IR-EXT-3520C, Rev. 3, Effective Date 01/28/2019

EPA Methods 608 and 8082/8082A, SOP No. IR-GCS-PCBs, Rev. 4.1, Effective Date 05/10/2019

Appendix C
December 3, 1996 Letter/Certification

Westates Carbon-Arizona, Inc.

2523 Mutahar Street
Post Office Box E
Parker, AZ 85344
Tel. 520-669-5758
Fax. 520-669-5775/5776

***VIA FEDERAL EXPRESS***

December 3, 1996

**FILE COPY**

Mr. John McCarroll
Permits Section Chief
Hazardous Waste Management Division
Mail Code WST-4 - 10th Floor
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

**RE: WESTATES CARBON-ARIZONA, INC.
EPA No. AZD 982 441 263
CERTIFICATION OF COMPLIANCE - SUBPART CC**

Dear Mr. Fox:

Westates Carbon-Arizona, Inc. (WCAI) operates a carbon reactivation facility in Parker, Arizona. A detailed description of the facility is provided in the Part B application dated November 1995. As discussed below, all waste management units at WCAI are either exempt from Subpart CC under §265.1080(b)(7), or exempt from the control requirements of Subpart CC under §265.1083(c). Therefore, based on our review of 40 CFR Part 270 - EPA Administered Permit Programs: The Hazardous Waste Management Program, there is no need to modify the Part B permit application for the WCAI facility to comply with the requirements of Subpart CC.

On November 25, 1996 the United States Environmental Protection Agency modified the air emission control standards that apply to certain waste management units, known colloquially as the Subpart CC standards (see 61 FR 59932). In part, the Subpart CC applicability was amended to exempt any hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with an applicable Clean Air Act regulation, including the Benzene Waste Operations National Emission Standard for Hazardous Air Pollutants (40 CFR Part 61, Subpart FF).

Pursuant to §265.1080(b)(7), WCAI hereby certifies that all waste management units potentially subject to Subpart CC, with the exception of Tank T-11, are equipped with and operate air emission controls in accordance with Subpart FF. EPA Region IX previously approved these air emission control systems as meeting the requirements of Subpart FF in its approval of an application to modify the facility under 40 CFR §61.07. The approval was granted by EPA Region IX on August 4, 1995 pursuant to 40 CFR §61.08 of the NESHAPs program.

As described in the Part B permit application, Tank T-11 collects scrubber water blow down, cooling water blow down, boiler water blow down and recycle water from Tank T-12, that has been filtered through activated carbon. Tank T-11 is not subject to the Benzene Waste NESHAPs because the benzene concentration in the water is less than 10 ppmw. Based on operator knowledge, Tank T-11 is exempt from the air emission control and inspection requirements pursuant to 40 CFR §265.1083(c)(1) because the average VO concentration of the wastes entering the unit is less than 500 ppmw (§264.1082(c)(1)). WCAI, will however, comply with the Subpart CC record keeping and monitoring requirements that are applicable to Tank T-11.

Please call me at (520) 669-5758 should you have any questions regarding the foregoing.

Sincerely,

Monte McCue
Plant Manager

cc: William Carlson (WESI)
Ray Fox (USEPA Region IX) (via fax)
Matt Killeen (WESI)
Steve Richmond (WESI)

State of ARIZONA
County of LA PAZ
On this 3 day of Dec, 1996, M. McCue personally appeared before me,
— whose identity I verified on the basis of _____,
✓ who is personally known to me,
— whose identity I verified on the oath/affirmation of _____,
a credible witness,
to be the signer of the foregoing document, and he/she acknowledge that he/she signed it.

Gail Sachak
Notary Public
My Commission expires: 2/22/99

OFFICIAL SEAL
GAIL SACHAK
NOTARY PUBLIC - STATE OF ARIZONA
LA PAZ COUNTY
My Comm Expires Feb. 22, 1999

PERMIT ATTACHMENT

SECTION Q

# SUBPART FF COMPLIANCE PLAN

Evoqua Water Technologies
2523 Mutahar Street
Parker, Arizona 85344

Revision 11
July 2019

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LIST OF CITED APPENDICES

## Q1 SUBPART FF COMPLIANCE PLAN

The Evoqua Water Technologies Parker facility manages all applicable tanks and containers regulated by the requirements of Subpart FF as specified in Section Q. The Subpart FF Compliance Plan is located in Appendix XXIII.

Subpart FF plan is being submitted for informational purposes to amend Permit Attachment Appendix XXIII. Pursuant to Permit Section IV.G.1.b, "[t]he Subpart FF Compliance Plan is attached for informational purposes only and is not considered a part of this Permit." Although not part of the final permit, this plan is used to satisfy certain requirements of the Subpart BB and CC plans.

# PERMIT ATTACHMENT

# APPENDIX XXIII

# SUBPART FF COMPLIANCE PLAN

EVOQUA WATER TECHNOLOGIES

PARKER REACTIVATION FACILITY

PARKER, ARIZONA

Revision 11
July 2019

# SUBPART FF
# COMPLIANCE PLAN

Revision 11 – July 2019

EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

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# TABLE OF APPENDICES

# 1. INTRODUCTION

This document summarizes the applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) for Benzene Waste Operations (Subpart FF) requirements and compliance plan for the Evoqua Water Technologies, Parker, Arizona facility. The main purpose of the document is to assist facility management and staff in understanding the relevant NESHAP Subpart FF requirements, and provide a tool for maintaining and tracking compliance documentation. Portions of the Facility's operations are also subject to RCRA Subpart CC and potentially Subpart BB, both of which control emissions of volatile organics, including benzene. Subparts BB and CC have provisions that allow compliance with Subpart FF in lieu of compliance with Subparts BB and CC. The Facility has chosen to implement the Subpart FF requirements where feasible in lieu of compliance with the control requirements of Subparts BB and CC.

The NESHAP regulations covered include:

- Subpart A - General Provisions (40 CFR 61.01, et seq.)
- Subpart FF - National Emission Standard for Benzene Waste Operations (40 CFR §61.340, et seq.)

Subpart A details the general provisions of the NESHAP regulations and applies to all facilities that trigger one or more of the emission standards outlined in the subsequent subparts. Subpart FF details the specific requirements for controlling benzene emissions from chemical manufacturing plants, petroleum refineries, and coke by-product recovery plants. This subpart also applies to facilities that treat wastes generated by facilities subject to Subpart FF; it is for this reason that the Parker, Arizona facility must comply with Subpart FF requirements (see §61.340(b)).

This document assumes that the total annual benzene quantity (TAB) for the Facility is less than 10 megagrams (Mg) per year. The Facility implements a TAB tracking system to closely monitor the facility TAB throughout the year, as changes to Facility practices, including additional controls, must be implemented before the Facility TAB equals or exceeds 10 Mg/yr.

The sections that follow describe the treatment processes at the Parker, Arizona facility, summarize the relevant rule requirements, and outline the facility's compliance plan.

# 2. FACILITY DESCRIPTION

The Parker, Arizona facility reactivates spent carbon from facilities that are subject to and facilities that are exempt from the requirements of Subpart FF. The spent carbon is deposited in one of two hoppers (H-1 and H-2) whose emissions are controlled by a baghouse and carbon absorber WS-2[1]. The spent carbon is stored in tanks (T-1, T-2, T-5, and T-6) prior to treatment. From the storage tanks, the slurry is pumped to the furnace feed tank (T-18) and is then dewatered before being

1 The baghouse and carbon adsorber WS-2 are not emissions controls regulated under Subpart FF because EPA has previously determined that the hopper is an "individual drain system" regulated under §61.346(b). These controls have been installed to mitigate potential dust and organic emissions from spent carbon unloading operations.

introduced into the reactivation unit. The storage tanks and furnace feed tank are connected to carbon adsorbers (WS-1 and WS-3) to treat any volatile organic compounds (VOC) that may be present in the tank vapors.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-2) and an afterburner (AB-2). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve destruction and removal efficiency greater than 99%. Under the language of Subpart FF and EPA guidance, the regenerated carbon is considered a product, not a waste. As such, the Facility is not required to demonstrate compliance with the benzene removal or destruction requirements in the regenerated carbon, provided the carbon is legitimately redeployed as a regenerated carbon product. The Facility confirms this by ensuring its regenerated carbon meets product specifications and is placed into inventory for reuse.

Reactivated carbon product is cooled before it is stored, packaged, and shipped. The hot gases from the reactivation treatment unit are further treated by air pollution control equipment prior to being routed through a stack to atmosphere.

The Parker, Arizona facility currently operates under a Final Permit issued under the Resource Conservation and Recovery Act (RCRA) and is limited to a maximum spent carbon feed to the furnace of 3049 lb/hr.

Sources of potential benzene emissions from Subpart FF waste include:

- Carbon adsorbers (WS-1 and WS-3), which control spent carbon storage and furnace feed tank VOC emissions, including benzene.
- Emissions associated with the reactivation treatment unit (RF-2 and AB-2).
- Fugitive emissions from containers of Subpart FF waste.
- Fugitive emissions from drain lines and vent systems between regulated equipment.

The processes subject to Benzene NESHAP compliance are highlighted in the facility process flow diagram located in Appendix A.

## 3.0 MANAGEMENT SUMMARY OF RULE REQUIREMENTS

### 3.1 Applicability Criteria for Designation of Affected Facilities (40 CFR §60.340)

Subpart FF applies to chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries, and to treatment, storage and disposal facilities (TSDFs) that treat, store, or dispose, of hazardous wastes containing benzene generated by these facilities (e.g., the Facility) (see §61.340(a) and (b)). Because the Facility’s TAB is less than 10 Mg/yr, it is subject only to TAB recordkeeping and reporting requirements under this section of the rule.

Subpart FF also applies to any facility that receives waste that is accompanied by a notice that the waste must be managed in accordance with Subpart FF (See 40 CFR §61.342(f)). The Facility receives wastes that have been designated as Subpart FF wastes under these provisions. All incoming wastes with a Subpart FF notice, including any subsequent mixtures of these wastes with any other materials, must be managed in compliance with Subpart FF requirements.

Incoming wastes from plants that are subject to Subpart FF (e.g., wastes from refineries, coke by-product recovery plants and chemical plants) which do not have a Subpart FF notice are presumed to not require Subpart FF controls at the Facility. If a generator provides a Subpart FF notice for a type of waste after prior shipments of that type have already been received, it is presumed that Subpart FF controls are required only from the date the Subpart FF notice is received.

## 3.2 Definitions (40 CFR 61.02 and 61.341)

Outlined below is a list of useful definitions that apply under NESHAP regulations. This list is not exhaustive and facility staff should reference the applicable subpart for additional information.

- Chemical Manufacturing Plant - any facility engaged in the production of chemicals by chemical, thermal, physical, or biological processes for use as a product, co-product, by-product, or intermediate including but not limited to industrial organic chemicals, organic pesticide products, pharmaceutical preparations, paint and allied products, fertilizers, and agricultural chemicals. See the definition at 40 CFR §61.341 for examples of some of the applicable process units.

- Capital Expenditure - An expenditure for a physical or operational change to a stationary source which exceeds a minimum threshold. The importance of the capital expenditure provisions is that modifications to existing facilities that result in an increase in emissions are not subject to NESHAP permitting requirements if the modifications can be accomplished without a "capital expenditure". The difficulty with determining whether a modification triggers the "capital expenditure" threshold is that the Internal Revenue Service (IRS) guidelines cited by EPA as the means of making this determination are no longer published. EPA recognizes that the IRS form is no longer available, and intends to modify this definition. In the meantime, EPA uses the following definition:

  Capital Expenditure > (Original Equipment Cost)(0.07)

  Capital expenditures are analyzed on a per project basis to determine if a modification will result from a change in operation.

- Closed Vent System - A system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.

- Coke By-Product Recovery Plant - any facility designed and operated for the separation and recovery of coal tar derivatives (by-products) evolved from coal during the coking process of a coke oven battery.

- Commencement of Construction - Construction commences when an owner or operator has undertaken a continuous program of construction or modification, or when an owner has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification. Under a strict reading of this definition, construction commences when an owner signs a contract for the construction of a new or modified emission unit subject to NESHAP regulations. However, this is not how EPA applies this definition. EPA has issued guidance to the effect that construction commences when any component of an emissions unit subject to NESHAP is affixed to a foundation. Under this guidance, the laying of a foundation or permanent installation of piping or electrical conduit associated with a NESHAP source is considered to be commencement of construction. Notably, EPA does allow the shipment of pre-fabricated equipment to a site, provided that equipment is not affixed to a foundation upon arrival at the NESHAP facility.

- Construction - Fabrication, erection, or installation of a facility subject to NESHAP regulations. More notably, construction of a facility subject to NESHAP regulations <u>cannot</u> be commenced without written approval from EPA or a delegated state that has been delegated that authority.

- Container - Any portable waste management unit in which a material is stored, transported, treated, or otherwise handled. Examples of containers are drums, barrels, tank trucks, dumpsters, tank cars, and dump trucks.

- Cover - A device or system which is placed on or over a waste placed in a waste management unit so that the entire waste surface area is enclosed and sealed to minimize air emissions. A cover may have openings necessary for operation, inspection, and maintenance of the waste management unit such as access hatches, sampling ports, and gauge wells provided that each opening is closed and sealed when not in use. Examples of covers include a fixed roof installed on a tank, a lid installed on a container, and an air-supported enclosure installed over a waste management unit.

- Individual Drain System – A system used to convey waste from a process unit, product storage tank, or waste management unit to a waste management unit. This term includes all process drains and associated sewer lines down to the receiving waste management unit.

- No Detectable Emissions - Less than 500 parts per million by volume (ppmv) above background levels, as measured by a detection instrument reading in accordance with the procedures specified in §61.355(h) of this subpart.

- Modification - Any physical or operational change to an existing facility that results in an increase in the emission rate to which a NESHAP regulation applies. The following changes are not considered modifications:

  - Maintenance, repair, and routine replacement, if such physical change does not increase the maximum potential to emit of a pollutant to which NESHAP regulations apply.

- An increase in production rate (i.e., feed rate) if that increase can be accomplished without a capital expenditure.
- An increase in the hours of operation.

The relocation or change in ownership of a stationary source. However, such activities must be reported to EPA, as discussed in Section 3.4 below.

- Petroleum Refinery - any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives.
- Point of Waste Generation - The location where the waste stream exits the process unit component or storage tank prior to handling or treatment in an operation that is not an integral part of the production process, or in the case of waste management units that generate new wastes, the location where the waste stream exits the waste management unit component.
- Tank - A stationary waste management unit that is designed to contain an accumulation of waste and is constructed primarily of non-earthen materials which provide structural support.
- Total Annual Benzene Quantity (TAB) - the sum of the annual benzene quantity for each hazardous waste stream from a chemical manufacturing plant, a coke by-product recovery plant, or a petroleum refinery received at the Facility that has a flow-weighted annual average water content greater than 10 percent or that is mixed with water, or other wastes, at any time and the mixture has an annual average water content greater than 10 percent, calculated in accordance with 40 CFR §61.355.
- Waste - Any material resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged.
- Waste Management Unit – A piece of equipment, structure, or transport mechanism used in handling, storage, treatment, or disposal of waste. Examples of a waste management unit include a tank, surface impoundment, container, oil-water separator, individual drain system, steam stripping unit, thin-film evaporation unit, waste incinerator, and landfill.
- Waste stream - The waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, benzene concentration, water content) are determined at the point of waste generation. Examples of

a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate.

### 3.3 Approval for New and Modified Facilities (40 CFR §§61.07 - 61.08)

Prior to commencement of construction or modification of a facility subject to NESHAP regulations, an owner or operator must submit an application to EPA or its delegated administrator. For the Parker, Arizona facility, the application should be submitted to EPA Region IX at the following address:

Elizabeth Adams (or her successor)
Director, Air and Toxics Division (AIR-3)
United States Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

The contents of the application should include:

- The name and address of the applicant.
- The location of the proposed source.
- Technical information describing the proposed nature, size, design, operating design capacity, and method of operation, including a description of any equipment to be used to control emissions. Such technical information shall include calculations of emissions in sufficient detail so that EPA can assess the validity of the calculations and determine compliance with the applicable standards.
- Applications for modifications should also include a description of the proposed nature of the changes, the productive capacity of the facility before and after the changes are completed, and calculations of emissions before and after the changes are completed. The calculations should be in sufficient detail so that EPA can validate them and determine compliance with applicable standards.

After submittal of the application, EPA Region IX will determine if the application is complete. If deemed complete, EPA will notify the applicant within 60 days of its intention to approve or deny the application. If EPA determines that the new or modified source will comply with the applicable NESHAP standards, construction will be approved.

Construction may be commenced as soon as EPA issues its approval of the application.

### 3.4 Notifications (40 CFR §§61.09, 61.10, 61.13(c), and 61.342(f))

The following written notifications shall be submitted to EPA Region IX:

- Anticipated start-up notification. This notification shall be provided no more than 60 days nor less than 30 days before start-up.

- Actual start-up notification. The notification of actual start-up shall be submitted within 15 days after the date of start-up.

- Existing source notification. This notification should have been submitted by April 7, 1993. The contents of this notification are outlined in 40 CFR 61.10

- Change in information notification. If any of the information provided in an application or in the existing source notification is changed even though the change does not constitute a modification (e.g., change in ownership, address, etc.), a notification shall be submitted within 30 days after the change.

- Emission testing notification. This notification should be submitted at least 30 days prior to testing.

- Subpart FF waste disposal notification. If Subpart FF wastes are shipped offsite for treatment at another facility, a notification must accompany each shipment stating that the wastes contain benzene that is required to be managed and treated in accordance with the provisions of Subpart FF (See 40 CFR §61.342(f)).

### 3.5 General Standards for Treatment Facilities (40 CFR §61.348)

The facility shall treat the waste received from Subpart FF waste generators to at least one of the following standards:

1. Remove benzene from the waste stream to a level less than 10 ppmw on a flow weighted annual average basis. The reduction of benzene concentration by dilution is not allowed [§61.348(a)(1)(I)].

2. Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)].

3. Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)].

4. Return the waste to a process to generate a new product [§61.342(c)(1)(iii)].

Under the language of Subpart FF and EPA guidance, the regenerated carbon is considered a product, not a waste. As such, the Facility is not required to demonstrate compliance with the benzene removal or destruction requirements in the regenerated carbon, provided the carbon is legitimately redeployed as a regenerated carbon product. The Facility confirms this by ensuring its regenerated carbon meets product specifications and is placed into inventory for reuse. However, all equipment used to manage the spent carbon up to and including the multiple hearth and afterburner must be managed in accordance with Subpart FF equipment standards. These standards are set forth in 40 CFR §61.343 through §61.349 (as applicable). The requirements for each type of equipment are covered in the following section except for surface impoundments and oil-water separators, which are not present at the Facility.

The Facility may occasionally generate a wastewater from the discard of motive water used in the Facility's production process to slurry incoming spent carbon prior to reactivation. The motive water is assumed to become a waste at the point that the Facility determines it is no longer useable for its intended purpose. At that point of waste generation, if the wastewater has a flow-weighted annual average benzene content of less than 10 ppmw, then it is exempt from further control requirements under §61.342(c)(2). If the flow-weighted annual average benzene concentration of discarded motive water is 10 ppmw or greater, the wastewater would need to be treated using a control device regulated by Subpart FF to achieve either a benzene content below 10 ppmw on a flow weighted annual average or 99% or more benzene removal on a mass basis, pursuant to §61.348(a)(1)(i) or (ii), or sent to a facility with a 61.342(f) notice that Subpart FF treatment is required.

All access doors or other potential openings shall be sealed and kept closed at all times when waste is being treated, except during inspection and maintenance. Visual inspections of each sealed opening shall be performed initially and quarterly thereafter to ensure that no cracks or gaps occur and that openings are sealed closed. All repairs of any identified gaps or broken seals shall be made within 15 days. Repairs may be delayed until the next unit shutdown if they cannot be completed without a partial or complete facility shutdown.

Facilities complying with standards numbered one and two above must also comply with the standards of 40 CFR §61.343 through §61.347, and §61.349 (if applicable). These sections provide the requirements for tanks, containers, surface impoundments, individual drain systems, oil-water separators, and closed vent systems. Since the Parker, Arizona facility does not operate surface impoundments and oil-water separators subject to NESHAP regulations, these requirements will not be covered in the following section.

## 3.6 Standards for Tanks, Containers, Individual Drain Systems and Closed Vent Systems (40 CFR §§61.343, 61.345, 61.346, and 61.349)

Table 1 summarizes the equipment design, inspection, and repair requirement outlined in 40 CFR 60.343, 61.345, 61.346 and 61.349. These standards apply to:

- Tanks
- Containers
- Individual Drain Systems
- Closed Vent Systems
- Control Devices

Defects or other problems detected during equipment inspections must be corrected within the time frames outlined in Table 1. Repair may be delayed until the next facility shutdown if it is technically infeasible to make the repair or correction without a partial or complete facility shutdown.

Table 1 – Summary of Subpart FF Requirements

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| Tanks (§61.343) | Fixed roof connected by closed vent to a control device; all potential openings shall be sealed closed except during inspection, repair, maintenance, removal, or sampling; the closed vent system and control device shall meet the requirements of §61.349 (discussed below). | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | 45 days |
| | Fixed roof with pressure relief device maintained in a closed position except during relief events (limitations apply, see note below). | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | 45 days |
| Note: A tank may be operated without a closed vent system if:<br>1) average water content is less than 10% by volume and maximum organic vapor pressure is less than 0.75 psia;<br>2) maximum organic vapor pressure is less than 4.0 psia and tank capacity is less than 40,000 gallons; or<br>3) maximum organic vapor pressure is less than 11.1 psia and tank capacity is less than 20,000 gallons. | | | | |
| Containers (§61.345) | All containers shall remain sealed closed except during periods of loading, unloading, inspection, or sampling; liquids pumped into a container must be done with a submerged fill pipe. | Visual inspection for cracks and broken seals; Method 21 to verify fugitives < 500 ppmv for containers >111 gallons | Initial and quarterly visual inspections; Annual Method 21 inspections. | 15 days |
| Note: Wastes treated within containers must be equipped with a closed vent system meeting the requirements of §61.349 (discussed below). Containers shipped offsite for treatment must meet the notification requirements of §61.342(f). | | | | |

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| Individual Drain Systems (§61.346) | Compliance option of §61.346(a): Each individual drain system opening must be equipped with a closed vent system and control device. Compliance option of §61.346(b): Each drain must be equipped with water seal controls or a tightly sealed cap or plug; each sewer line shall be covered or enclosed with no visual gaps or cracks. | Visual inspection for cracks and broken seals.<br><br>Method 21 to verify fugitive emissions <500 ppmv | Initial and quarterly visual inspections. Initial and annual Method 21 inspections. | 15 days |
| Treatment Processes (§61.348) | Each treatment process must remove benzene to < 10 ppmw (dilution is not allowed), or remove or destroy benzene by ≥ 99 wt%; each treatment process must comply with the standards of §§61.343 - 61.347; compliance must be demonstrated either by engineering calculations (§61.356(e)) or performance tests (§61.355); all potential openings shall be sealed closed except during inspection and maintenance or return waste to a process to generate a new product (§61.342(c)(1)(iii). | Visual inspection for cracks and broken seals; inspection of units according to §§61.343 - 61.347. | Initial and quarterly visual inspections; inspection of units according to §§61.343 - 61.347. | 15 days |
| Closed-vent Systems and Control Devices(§61.349) | The vent system shall remain closed and connected to a control device; bypass lines shall have a flow indicator or a car-seal or lock-and-key seal; all gauging and sampling devices shall be gas-tight except when gauging or sampling; control device must be monitored according to §61.354(c) (see note below); control device must be operated at all times when waste is present, except for maintenance and repair requires shutdown; | Visual inspection; Method 21 to verify fugitives < 500 ppmv. | Initial and quarterly visual inspections; Initial and annual Method 21 inspections. | First attempt: 5 days; Full repair: 15 days. |
| | An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) must: reduce organic emissions by 95 wt%; achieve organic concentration ≤ 20 ppmv, corrected to 3% oxygen; or provide minimum residence time of 0.5 sec at minimum temperature of 760°C; vent must be introduced into flame zone of boiler or process heater (§61.349(a)(2)(i)). | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |

| Component | Equipment Design | Inspection Methods | Inspection Frequency | Repair Deadline |
|---|---|---|---|---|
| | A vapor recovery system (e.g., carbon adsorption system or condenser) must: recover or control organic emissions by 95 wt%, or recover or control benzene emissions by 98 wt%; carbon canisters must be replaced immediately upon breakthrough (§61.349(a)(2)(ii)). | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |
| | Any other control device must achieve organic control of 95 wt% or benzene control of 98 wt%. | Visual inspection; monitoring according to §61.354(c) (see note below). | Initial and quarterly visual inspections; daily monitoring device inspections (see note below). | First attempt: 5 days; Full repair: 15 days. |

Note: §61.354(c) specifies the following required monitoring of operations for control devices subject to §61.349; the data recorded by the monitoring equipment must be inspected at least once each operating day to ensure proper operation of the control device, which in pertinent part are as follows:

(1) for a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder;

(2) for a control device subject to §61.349(a)(2)(iv) (other devices), devices to monitor the parameters specified in §61.349(a)(2)(iv)(C); and

§61.354(d) specifies the required monitoring of carbon adsorption systems that do not regenerate the carbon bed directly on site (e.g., carbon canisters): organic or benzene outlet concentrations shall be monitored daily, or at intervals no greater than 20% of the design carbon replacement interval (whichever is greater), to indicate when breakthrough has occurred or replace carbon earlier than the design breakthrough period.

## 3.7 Compliance Demonstration (40 CFR §§61.13, 61.355, and 61.356(e) - (f))

Subpart FF requires the owner or operator to demonstrate compliance with the applicable general standards for waste treatment facilities and the applicable standards for closed vent systems and control devices. Compliance may be demonstrated either through engineering calculations or performance testing, which are discussed in turn below.

### 3.7.1 Engineering Calculations (40 CFR §61.348(c)(1))

Compliance with the general standards for waste treatment facilities [§61.348(a)(1)(I) - (iii)] may be demonstrated with engineering calculations. These calculations must demonstrate compliance at maximum waste flow rate and maximum benzene content conditions and be available prior to facility start-up. As discussed in Section 3.9, these calculations shall be maintained for the life of the facility and include all supporting technical information (e.g., design specifications, drawings, etc.). See 40 CFR 61.356(e)(2) for additional information.

Carbon canisters and their associated closed vent systems must meet specific calculation requirements of 40 CFR 61.356(f)(2)(i)(G). Briefly, this analysis must consider the vent stream composition, benzene and constituent concentration, flow rate, relative humidity, and temperature. Based on these data, the operator must calculate the effective control capacity of the carbon canister and define the appropriate replacement interval to assure that the carbon canister maintains its control effectiveness.

For the afterburner, the specific calculation requirements are set forth in 40 CFR §61.356(f)(2)(i)(A). In general, this analysis must consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

### 3.7.2 Performance Testing (40 CFR §61.348(c)(2))

If emissions testing is used to demonstrate compliance, the tests must be performed within 90 days of start-up for new units, or April 7, 1993 for existing units. Additionally, the EPA can at anytime require that such testing be performed to demonstrate compliance with Subpart FF requirements [40 CFR 61.13(b)]. The results of the emissions tests shall be reported to EPA Region IX within 31 days following the completion of testing. As discussed in Section 3.9, the results should be retained for the life of the facility.

The specific source tests that may be performed in lieu of engineering calculations are as follows:

| COMPLIANCE STANDARD | TEST METHODS REFERENCE |
|---|---|
| Remove benzene to a 10 ppmw concentration [§61.348(a)(1)(i)] | See §61.355(d) |
| Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)] | See §61.355(e) |
| Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)] | See §61.355(f) |
| Meet control device performance requirements specified in §61.349(a)(2) | See §61.355(i) |

### 3.7.3 Method 21 Testing (40 CFR §61.355(h))

All inspections performed using an organic vapor analyzer (OVA) shall be performed consistent with the requirements of EPA Method 21 from Appendix A of 40 CFR 60. Calibrations and testing shall also be performed consistent with 40 CFR 61.355(h).

## 3.8 Monitoring of Operations (40 CFR §§61.14 and 61.354)

Compliance monitoring must be performed as outlined below:

| COMPLIANCE STANDARD | MONITORING METHODS AND FREQUENCY |
|---|---|
| Remove benzene to a 10 ppmw concentration [§61.348(a)(1)(I)]. | Sample exiting streams on a monthly basis using the methods prescribed by §61.355(c); or, monitor a parameter or parameters on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |
| Remove benzene from the waste stream by 99 percent or more on a mass basis [§61.348(a)(1)(ii)]. | Monitor a parameter or parameters on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |
| Destroy benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene [§61.348(a)(1)(iii)]. | Monitor a parameter or parameters (e.g., temperature) on a continuous basis to assure proper system operation and inspect recorded data daily for each monitored parameter. |

| COMPLIANCE STANDARD | MONITORING METHODS AND FREQUENCY |
|---|---|
| Meet control device performance requirements for carbon canisters as specified in §61.349(a)(2) | Replace canister at a specified interval as determined through engineering calculations; or, monitor the VOC content in the exhaust on a daily basis or at an interval not to exceed 20% of the design carbon replacement interval. |

## 3.9 Recordkeeping Requirements (40 CFR §61.356)

All records required by Subpart FF shall be maintained in a readily accessible location at the facility site for a period not less than two years, unless otherwise specified below. The records that must be maintained include:

- A list of the streams subject to Subpart FF compliance and whether or not the waste stream is controlled for benzene emissions (§61.356(b)).
- For each waste stream not controlled in accordance with Subpart FF, all test results and other documentation used to define the stream identification, water content, whether or not the waste stream is process wastewater, annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity (§61.356(b)(1)).
- For each waste shipment sent offsite for treatment, the date the waste is shipped offsite, quantity of waste shipped offsite, the name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment (§61.356(c)).
- Engineering design documentation for all control equipment. The documentation should be retained for the life of the facility (§61.356(d)).
- A signed and dated statement certifying that the treatment unit is designed to operate at the documented performance level when the waste stream entering the facility is at the highest flow rate and benzene concentration. This signed statement should be retained for the life of the facility (§61.356(e)(1)).
- For closed-vent systems and control devices, a signed and dated statement certifying that each system and device is designed to operate at the documented performance level when the waste management unit vented to the control device is or would be operating at the highest load or capacity expected to occur. This signed statement must be retained for the life of the unit (§61.356(f)).
- If engineering calculations are used to demonstrate compliance with the general standards for treatment facilities [§61.348(a)(1)(I) - (iii)], a complete design analysis that includes supporting technical information (e.g., design specifications, etc.) should be maintained for

the life of the facility (§61.356(e)(2)).

- For all performance test results used to demonstrate compliance with the general standards for treatment facilities [§61.348(a)(1)(I) - (iii)], maintain for the life of the facility the documentation required in 40 CFR §61.356(e)(3).

- A signed and dated statement certifying that the closed vent system and control device is designed to operate at the documented performance level at the highest load or capacity expected to occur (§61.356(f)(1)).

- If engineering calculations are used to determine control device performance, then a design analysis should be retained for the life of the control device that includes specifications, drawings, and other documentation supporting the calculations. For carbon canisters, the design analysis should include information required in 40 CFR §61.356(f)(2)(I)(G).

- For all test results used to determine control device performance, maintain testing results for the life of the control device as outlined in 40 CFR §61.356(f)(3).

- Visual inspection records that include the date of each inspection, the treatment unit or control equipment inspected, description of any problem identified, a description of the corrective action taken, and the date the corrective action was completed (§61.356(g)).

- Method 21 inspection records that include the dates of inspection, background level measured, and the maximum concentration measured at each potential leak interface. If a leak is detected, then the records shall include the location where the leak was detected, a description of the problem, a description of the corrective action taken, and the date the corrective action was completed (§61.356(h)).

- Dates of start-up and shutdown of the treatment unit, and periods when the treatment unit is not operating as designed (§61.356(i)(1) & (5)).

- Dates of start-up and shutdown of the closed-vent system, and periods when the closed-vent system is not operating as designed (§61.356(i)(1) & (3)).

- Testing results from all monthly waste stream sampling performed in accordance with 40 CFR §61.354(a)(1). The results should also include the date each test is performed (§61.356(i)(2)).

- Descriptions of any process parameters that are monitored to ensure the treatment unit is operating in compliance with Subpart FF. The descriptions should include reasons why the parameter(s) was/were selected. This documentation should be maintained for the life of the facility (§61.356(i)(3)).

- Descriptions of any process parameters that are continuously monitored to ensure the control device is operating in compliance with Subpart FF. The descriptions should include the control device's specifications, and reasons why the parameter(s) was/were selected. This documentation should be maintained for the life of the facility (§61.356(j)(2)).

- Periods and durations when the closed-vent system and control device are not operated as designed (§61.356(j)(3)).

- Date and time when the carbon canisters are monitored (if applicable), when breakthrough is measured (if applicable), and when the canister is replaced (§61.356(j)(10)).

### 3.10 Reporting Requirements (40 CFR §§61. 13(f) and 61.357)

The following reports shall be submitted to EPA Region IX:

- Performance test reports. These reports shall be submitted within 31 days following testing and should include the information required in 40 CFR §61.356(e)(3) or §61.356(f)(3), as applicable (§61.13(f)).

- Initial Subpart FF report. This report should have been submitted by April 7, 1993 for existing facilities, and be submitted at start-up for facilities constructed after January 7, 1993. The contents of the report are outlined in 40 CFR §61.357(a)(1) - (3).

Annual Subpart FF TAB report (Appendix D).2 As outlined in the rules, if the total amount of benzene waste included in the Facility TAB is equal to or greater than 1.0 Mg/yr (1.1 ton/yr), but less than 10 Mg/yr (11 ton/yr), the operator shall submit a report by April 7 each year updating the TAB, identifying the controlled/uncontrolled and organic/aqueous designations of each waste stream, along with other data described in 40 CFR §61.357(a)(1)-(3) (§61.357(c)).[3] If the Facility's TAB is 10 Mg/yr or greater, additional reporting is required pursuant to 40 CFR §61.357(d), including certification of equipment installation and quarterly reporting. The Facility may be deemed to know its TAB calculation throughout the year as wastes are received, and it is therefore essential that the Facility track this information continuously so that it can respond immediately before its TAB ever equals or exceeds 10 Mg/yr.

## 4.0 EVOQUA WATER TECHNOLOGIES, PARKER, ARIZONA FACILITY COMPLIANCE PLAN

### 4.1 NESHAP Subpart FF Applicability to the Parker, Arizona Facility

NESHAP Subparts A and FF apply to the spent carbon storage and treatment processes within the facility. All affected process units and storage tanks are equipped with controls to benzene emissions to the atmosphere.

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2 If the facility TAB is less than 1 Mg/yr, then no TAB report is required unless there is a change that could cause the TAB to increase to 1 Mg/yr or more.

3 Chemical plants, coke by-product recovery plants and refineries with a TAB equal to or greater than 1 Mg and less than 10 Mg/yr are usually not subject to BWON control requirements. 40 C.F.R. §61.342(a). Thus, the purpose of the annual report for these facilities is typically to confirm that the TAB remains below 10 Mg. However, TSD facilities that treat BWON-regulated wastes received from off-site facilities must provide the same degree of control as the generating facility would so they may be subject to BWON control even if their TAB is less than 10 Mg/yr.

The specific process components subject to Subpart FF compliance are as follows:

| I.D. NO. | DESCRIPTION | APPLICABLE STANDARD | COMMENTS |
|---|---|---|---|
| N/A | Spent Carbon Containers Received from Offsite | §61.345 | Subpart FF wastes are stored in drums, vessels, and supersacks. |
| N/A | Containers/Bins Storing Wastes Generated Onsite that May Contain FF Wastes | §61.345<br>§61.342(f) | Benzene wastes shipped offsite must meet the container reqts. and offsite shipment reqts. |
| H-1<br>H-2 | Spent Carbon Unloading Hoppers Nos. 1 and 2 and associated transfer lines | §61.346(b) | These hoppers are individual drain systems, which are equipped with covers; the hoppers are controlled by a baghouse and carbon adsorption (WS-2), which are not regulated under Subpart FF (see footnote 1 above). |
| T-1 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-2 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-5 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-6 | Spent Carbon Storage Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-9 | Recycle Water Tank | §61.343 | Tank vapors controlled by carbon adsorption (WS-1). |
| T-18 | Furnace Feed Tank | §61.343 | Tank vapors controlled by carbon adsorption<br>(WS-3) |
| RF-2 | Reactivation Furnace No.2 | §61.348 | Regenerated carbon must meet product specifications |
| AB-2 | Afterburner No. 2 | §61.349(a)(2)(i)(c) | Minimum residence time of 0.5 seconds at a minimum temperature of 1400 F |
| C-5 | Dewater Screw | §61.346(a) | Emissions routed to the afterburner (AB-2) |
| C-16 | Weight belt | §61.346(a) | Emissions routed to the afterburner (AB-2) |
| WS-1 | Carbon Adsorber No. 1 | §61.349 | Carbon Canister replaced prior to design breakthrough |
| WS-3 | Carbon Adsorber No. 3 | §61.349 | Carbon Canister replaced prior to design breakthrough |

The Parker, Arizona facility is required to regenerate spent carbon to a useful product. Compliance with 40 CFR §61.348 also requires that the upstream tanks, containers, individual drain systems and control devices noted in the table above, along with any associated piping or closed-vent system, must meet the applicable requirements of Subpart FF (i.e., §61.343, §61.345, §61.346 and §61.349).

The debris bin and associated drums that are used to store FF wastes from the facility, must not only meet the container requirements of 40 CFR §61.345, but also the requirements of 40 CFR §342(f). Section 342(f) requires that a notice accompany each waste shipment indicating that the wastes must be treated in accordance with the standards of Subpart FF. Records must be maintained indicating the date the waste is shipped offsite, quantity of waste shipped offsite, the name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment (§61.356(c)).

Hoppers H-1 and H-2 are used to convey Subpart FF wastes from containers and other waste management units to the regeneration system. As such, these units are considered individual drain systems, which meet Subpart FF requirements under 61.346(b). Each of the units is equipped with a cover, which is kept closed when the hoppers are not being used to convey Subpart FF wastes. The associated lines that convey Subpart FF wastes from H-1 and H-2 to the Spent Carbon Storage Tanks (T-1, T-2, T-5 and T-6) are hard piping and are inspected quarterly for any evidence of leaks (open valves, indications of low liquid levels, rips, tears, or cracks in equipment, etc.). Any repairs that are identified as required during these quarterly inspections are performed within 15 days, as required (See Section 4.4, below).

The process wastewater stream associated with the wet scrubber control system has been specifically excluded from NESHAP applicability since it does not come in contact with Subpart FF waste streams. Additionally, water that comes in contact with Subpart FF waste is also exempt from Subpart FF treatment requirements under 40 CFR §61.342(c) as long as it contains less than 10 ppmw total benzene on an annual weighted average basis. The facility drain system is also exempt from Subpart FF compliance since it does not handle Subpart FF waste. Subpart FF wastes, which are contained in closed drums and roll-offs are managed so that none of these materials is allowed to enter the maintenance drains within the facility during surface cleaning operations.

## 4.2 Compliance Responsibilities

The Plant Manager has the primary responsibility for overseeing the NESHAP Subpart FF compliance program for the Parker, Arizona facility. More specifically, the Plant Manager assures that all permitting, notifications, monitoring, inspections, recordkeeping, and reporting are performed in accordance with the applicable regulations. The Plant Manager is responsible for assuring that all needed repairs and other maintenance activities are performed as required. The Plant Operator is responsible for monitoring the day-to-day operation of the facility.

## 4.3 Permitting and Notifications

All proposed changes to the Parker, Arizona facility are reviewed by the Plant Manager or his designee to determine if the modification provisions of the NESHAP regulations have been triggered. In making this determination, the Environmental Plant Manager or his/her designee will determine whether or not the changes can potentially increase benzene emissions. If the changes will not increase benzene emissions, then the NESHAP modification provisions are not triggered. If the changes have the potential to increase facility benzene emissions, then the Environmental Health and Safety Manager or his/her designee will determine if the capital expenditure threshold will be exceeded by the project. As noted in Section 3.2, a capital expenditure is incurred for NESHAP applicability when the cost of the changes exceeds seven percent of the original facility cost.

If the changes are deemed as "modifications", the Environmental Health and Safety Manager or his/her designee will prepare a permit application that conforms to the requirement of Section 3.3 and submit it to EPA Region IX. No facility changes will be made until EPA approves the application.

The Environmental Health and Safety Manager or his/her designee is responsible for making all notifications required by NESHAP Subpart A and Subpart FF. The contents of these notifications are outlined in Section 3.4. Copies of relevant notifications are maintained in Appendix B of this plan.

## 4.4 Inspection and Repair

The Environmental Health and Safety Manager or his/her designee performs all routine quarterly visual inspections of the facility. During these inspections, the Environmental Health and Safety Manager or his/her designee examines the stationary equipment listed in Section 4.1 and its interconnecting piping for cracks, gaps, or other problems. In addition, the Environmental Health and Safety Manager or his/her designee visually inspects all spent carbon containers maintained onsite for more than one quarter year. Each visual inspection is documented on the Visual Inspection Form and copies of completed forms are maintained in the Facility files.

The Environmental Health and Safety Manager or his/her designee performs the Method 21 inspections annually during periods when the facility is processing Subpart FF waste. During these inspections, the Environmental Health and Safety Manager or his/her designee inspects all potential leak sources listed on the Annual Method 21 Inspection Form. The Environmental Health and Safety Manager or his/her designee documents the results of the inspection on the Annual Method 21 Inspection Form and maintains copies of the completed forms in the Facility files. Spent carbon containers maintained onsite for more than one year must be included in this inspection.

The initial inspections of Subpart FF waste containers delivered to the Parker, Arizona facility are completed by the respective generator of the waste. This inspection includes both a visual inspection of the container and a Method 21 inspection of all potential leak interfaces. As noted above, containers maintained for more than one quarter year at the facility, will be visually inspected by the Environmental Health and Safety Manager or his/her designee during the routine quarterly visual inspection. Furthermore, containers maintained onsite for more than one year must be inspected using Method 21.

The debris bin and baghouse drum shall be visually inspected and inspected using Method 21 by the Environmental Health and Safety Manager or his designee following initial loading with Subpart FF containing wastes. In addition, the debris bin and containers will be visually re-inspected if it is onsite for more than 90 days (with the exception of the debris bin which cannot be stored longer than 90 days). These inspections shall be documented in the Debris Bin and Associated Drums Inspection Log found in the Facility files.

All leaks (defined as an instrument reading exceeding 500 ppmv over background), openings, cracks or other problems identified during the visual and Method 21 inspections will be repaired within the time frames established in Table 1 (see Section 3.6, above). The Environmental Health and Safety Manager or his/her designee who detects the leak will work with the Plant Manager or his/her designee to complete the repair. Completed repairs will be documented on the affected inspection forms maintained in the Facility files.

If a repair cannot be completed within the specified time without a partial or complete facility shutdown, the Environmental Health and Safety Manager or his/her designee will document in the affected inspection form the reason why the repair is delayed. The Environmental Health and Safety Manager or his/her designee will ensure that all repairs are completed during the next process unit shutdown, and document in the affected inspection form the completion of the repair.

## 4.5 Monitoring

Compliance with the general treatment requirements are monitored as follows:

| EQUIPMENT COMPONENT / MATERIAL | APPLICABLE STANDARD | MONITORING METHOD | FREQUENCY |
|---|---|---|---|
| Afterburner (AB-2) | §61.349(a)(2)(i)(c) | Temperature | Continuous |
| Wastewater in Contact with Spent Carbon Discharged to POTW | §61.342(c)(2) | Benzene concentration (minimum of three (3) samples) determined by methods prescribed by §61.355(c)(2) | Annual |
| Carbon Adsorber (WS-1) | §61.349(a)(2)(ii) | Calculations in Appendix C show that the canister must be replaced at least every 7.88 days. | 7.88 days at a maximum or more frequently |
| Carbon Adsorber (WS-3) | §61.349(a)(2)(ii) | Calculations in Appendix C show that the canister must be replaced at least every 38 days. | 38 days at a maximum or more frequently |

The Plant Operator reviews all temperature readings on a daily basis to assure that the reactivation furnace is operating as designed, and the afterburner is maintained at a temperature greater than 760$^{o}$C (1400$^{o}$F) when spent carbon is in the unit. If the temperature data for the afterburner indicate a performance problem, the Plant Operator will correct the problem as soon as possible. The reasons justifying the use of temperature as the main monitoring parameter are provided in Appendix D.

To comply with the requirements of 40 CFR §61.356(b), the Environmental Health and Safety Manager or his/her designee shall verify on an annual basis the annual flow rate and the benzene concentration in the untreated wastewater in contact with spent carbon (minimum of 3 samples). Determinations shall assure that the benzene concentration in the wastewater is less than 10 ppmw and records will be maintained in the Facility files.

The Plant Manager or his/her designee will replace the carbon in adsorbers WS-1 and WS-3 in accordance with the schedule identified above. Immediately following adsorber replacement, the Plant Manager or his designee will document the change-out in the Carbon Canister Replacement Log maintained in the Facility files.

Any periods of malfunction, equipment start-up and shutdown will be logged by the Plant Operator in the Process Monitoring log. These logs are maintained in the file room.

### 4.6 Performance Testing

No emissions testing has been performed to demonstrate compliance with the applicable standards of Subpart FF. All compliance determinations have been performed through engineering calculations. Calculations documenting the performance of the carbon adsorbers are included in Appendix C.

### 4.7 Recordkeeping

The following table identifies all applicable Subpart A and FF records required to be maintained at the Parker, Arizona facility, the individual responsible for its maintenance, and the location where the records are stored. Unless otherwise noted in the table, the records will be maintained for a minimum of two years, as required by NESHAP regulations.

NESHAP FF RECORDKEEPING PLAN
EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

| Record Description | Individual Responsible | Comments/Location |
|---|---|---|
| Notifications (§§61.09, 61.10, 61.13(c), and 61.342(f)) – Note: the initial notification should be retained for the life of the facility | Plant Manager | Appendix B of the Compliance Plan (see Section 3.4) |
| List of streams subject to Subpart FF | Plant Manager | Section 4.1 of the Compliance Plan |
| Total annual benzene reports | Plant Manager | Facility files and Appendix E |
| Date the debris bin and associated drums shipped offsite, quantity of waste shipped offsite, name and address of facility receiving waste (§61.356(c)) | Plant Manager | Waste manifests in Plant Manager's office |
| Engineering design documentation of control equipment (§61.356(d))* | Plant Manager | Plant Manager's office |
| Engineering calculations demonstrating Control Equipment performance (§61.356(f)(2)(i)(G))* | Plant Manager | Appendix C of Compliance Plan |

NESHAP FF RECORDKEEPING PLAN
EVOQUA WATER TECHNOLOGIES
PARKER, ARIZONA FACILITY

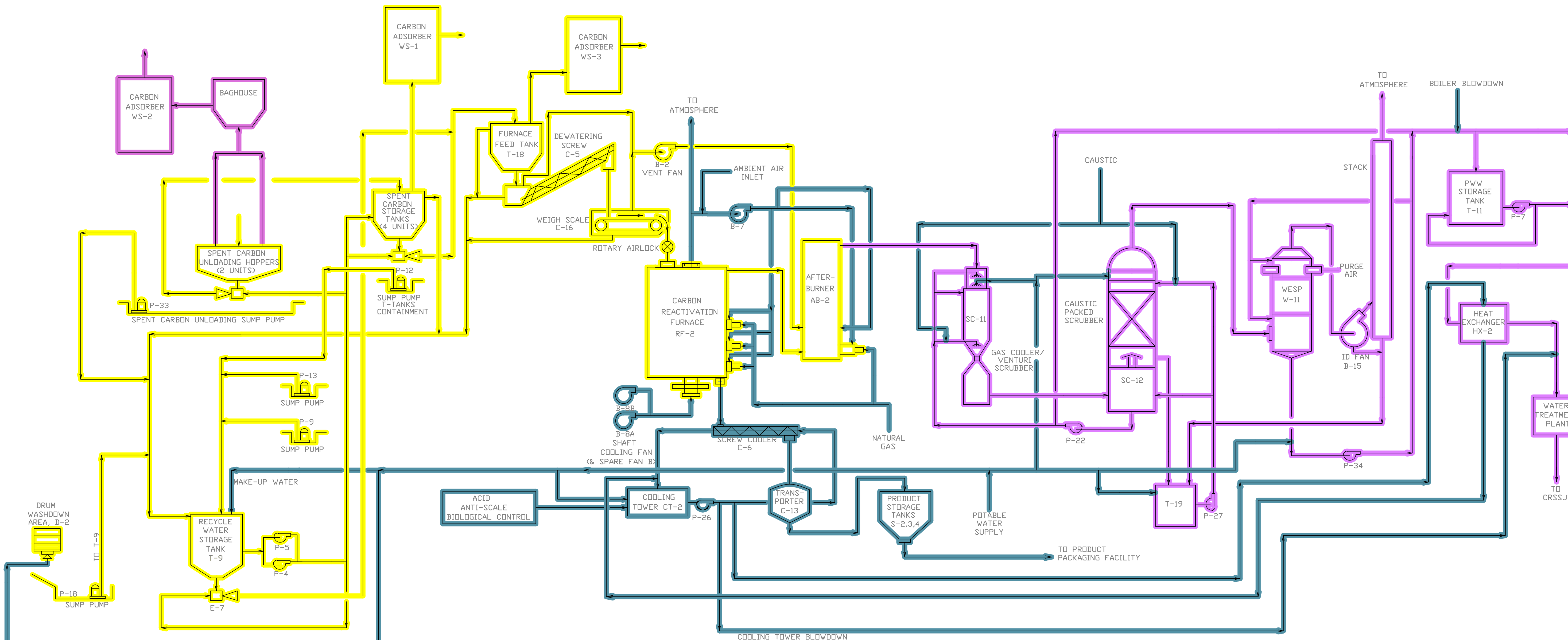
| Record Description | Individual Responsible | Comments/Location |
|---|---|---|
| Test results demonstrating control equipment performance (§61.356(f)(3))* | N/A | Not Applicable. Calculations have been used in lieu of testing results. |
| Visual inspection records (§61.356(g)) | Plant Manager | Facility files and Appendix E |
| Method 21 inspection records (§61.356(h)) | Plant Manager | Facility files and Appendix E |
| Dates of start-up, shutdown, and malfunction of treatment unit (§61.356(i)(1) & (5)) | Plant Operator | Process Monitoring Log maintained in Plant Manager's office |
| Testing results from all monthly sampling (§61.356(i)(3)) | N/A | Not Applicable. No monthly sampling of regenerated carbon required since regenerated carbon is a product |
| Descriptions of process parameters monitored to ensure treatment unit performance (§61.356(i)(3))* | Plant Manager | Appendix D of the Compliance Plan |
| Dates of startup, shutdown, and malfunction of the carbon absorbers (§61.356(j)(1) & (3)) | Plant Operator | Process Monitoring Log maintained in Plant Manager's office |
| Descriptions of process parameters monitored to ensure control device performance (§61.356(j)(2))* | N/A | Not Applicable. The Carbon Absorbers (WS-1 and WS-3) are changed-out on a predetermined frequency; no monitoring is performed. See Appendix C of the Compliance Plan. |
| Date and time when the carbon absorbers are monitored and replaced (§61.356(j)(10)) | Plant Manager | Facility files and Appendix E |

Records noted with an asterisk (*) must be maintained for the life of the facility. Otherwise, facility is to maintain records for two years (§61.356(a)).

## 4.8 Reporting

The Environmental Health and Safety Manager or his/her designee shall prepare the Annual Subpart FF Report and submit it to EPA to EPA Region IX by April 7th of each year whenever the facility TAB is 1 Mg/yr or greater. This report will cover the previous calendar year's activities and meet the requirements of 40 CFR 61.357(a)(1)-(3). Copies of the report will be maintained in the Facility files.

# Appendix A
# Process Flow Diagram




SUBJECT TO NESHAP SUBPART FF

EXEMPT FROM SUBPARTS BB, CC, AND FF (SEE COMPLIANCE PLANS FOR BASES)

NOT SUBJECT TO SUBPARTS BB & CC (DOES NOT COME IN CONTACT WITH HAZARDOUS WASTE)

| NO | DWN | CK'D | APP | REVISIONS | DATE |
|---|---|---|---|---|---|
| 0 | KAC | ATH | | UPDATED FROM PC-1466 PR-003 | 3-5-19 |

CBE CHAVOND-BARRY ENGINEERING CORP.
400 Route 518 • P.O. Box 205 • Blawenburg, New Jersey 08504

EVOQUA WATER TECHNOLOGIES
2523 MUTAHAR STREET, PARKER, AZ 85344

PROCESS FLOW DIAGRAM
SUBPARTS BB, CC, AND FF APPLICABILITY

| DRAWN | DATE | CHECKED | DATE | APPROVED | DATE |
|---|---|---|---|---|---|
| JBE | 1/10/01 | KEM | 1/18/07 | | |

SCALE: NONE | DWG. NO.: FIGURE 1 | REV.: 0

PRINT DATE: 3/7/19

# Appendix B
Copies of Notifications

Westates Carbon-A[illegible]zona, Inc.

2523 Mutahar Street
Post Office Box E
Parker, AZ 85344
Tel. 602-669-5758
Fax. 602-669-5775/5776

**BY HAND DELIVERY**

June 6, 1995

Mr. David Howecamp
Director, Air and Toxics Division (A-1)
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

FILE COPY

**RE: Westates Carbon-Arizona, Inc. (WCAI)**
**Notifications Pursuant to Benzene NESHAP**

Dear Mr. Howecamp:

Please find enclosed one copy of the following documents with respect to the WCAI facility in Parker, Arizona:

1) Existing Source Notification as required by 40 CFR §61.10;

2) Supplement to regulatory status notification as required by 40 CFR §61.357(a); and

3) Subpart FF annual reports for calendar years 1993 and 1994.

Representatives of WCAI discussed the applicability of Subpart FF with Mr. Eric Auer of EPA Region IX by telephone on May 25, 1995, and requested a meeting to discuss related issues.

A meeting has been scheduled at Region IX on the date of this letter and is expected to include representatives of WCAI and Mr. Auer and Ms. Jennifer Fox of EPA Region IX.

As discussed previously with Mr. Auer, WCAI conducted an extensive internal compliance audit earlier this year and determined that Subpart FF requirements were applicable at its facility to an extent not previously understood. WCAI immediately located and hired a consultant with experience in Subpart FF compliance who prepared a program to ensure our facility would fully comply with all Subpart FF requirements. The enclosed documents are a direct result of these activities and ensure that WCAI achieves full compliance with Subpart FF.

We anticipate a discussion of these documents with Mr. Auer and Ms. Fox today and remain ready to work with Region IX to ensure continuous compliance with this complex set of regulations.

Sincerely,

Monte McCue
Plant Manager

## EXISTING SOURCE NOTIFICATION REQUIRED BY 40 CFR 61.10
## WESTATES CARBON - ARIZONA, INC.

The following information is provided as required by 40 CFR 61.10:

**1. Name and Address of the Owner or Operator [§61.10(a)(1)]:**

Westates Carbon - Arizona, Inc.
P.O. Box E
2523 Mutahar Street
Parker, Arizona 85344

FILE COPY

Contact: Mr. Monte McCue, Plant Manager
Phone: (520) 669 - 5758
FAX: (520) 669 - 5775

**2. The Location of the Source [§61.10(a)(2)]:**

The facility is located in La Paz County, Arizona near the city of Parker. The facility is located within the Colorado River Indian Tribes (CRIT) reservation lands. EPA retains jurisdiction over this facility as its authority has not been delegated to tribal authorities [See 40 CFR 52.120 et seq.].

**3. Type of Hazardous Air Pollutants Emitted [§61.10(a)(3)]:**

This facility potentially emits benzene, a substance which is regulated under Subpart FF - National Emission Standard for Benzene Waste Operations (§61.340 et seq.). Additional hazardous air pollutants potentially emitted from the facility in trace amounts include, but are not limited to the following:

| | |
|---|---|
| Aniline | Benzo(a)Anthracene |
| Benzo(b)Fluoranthene | Carbon Tetrachloride |
| Chlorobenzene | Chloroform |
| Cresol | Dibenzofuran |
| Dioxane (1,4 -) | Ethylbenzene |
| Hexane | Hexane (1 -) |
| Methyl Ethyl Ketone | Methyl Isobutyl Ketone |
| Methyltertiarybutyl Ether | Naphthalene |
| Pentachlorophenol | Phenol |
| Propylbenzene | Tetrahydrofuran |
| Toluene | Triethylamine |
| Xylene | Arsenic |
| Cadmium | Chromium |
| Beryllium | Lead |
| Mercury | Nickel |
| Selenium | Antimony |

The above list is a conservative representation of potential hazardous air pollutants emitted from the facility because it has been based on analyses of Subpart FF waste received, and not upon emission testing results. The remaining sections of this notice will discuss the control of benzene emissions as it is the only hazardous air pollutant regulated by Subpart FF.

**4. Brief Description of the Operation [§61.10(a)(4)]:**

The Westates Carbon-Arizona, Inc. (WCAI) Parker, Arizona facility is an existing carbon reactivation facility. Activated carbon is used in pollution control equipment to remove organic compounds and other materials from liquid and vapor phase process and waste streams. Once the carbon is "spent" (i.e., utilized to its adsorptive capacity), it must either be disposed of or reactivated at a facility such as WCAI's Parker, Arizona facility. Some of the spent carbon processed at the Parker facility is received from facilities subject to Subpart FF.

Spent carbon is reactivated in the facility reactivation treatment unit, which consists of a multiple hearth furnace (RF-1) and an afterburner (AB-1). In this treatment unit, organic contaminants such as benzene are thermally destroyed by high temperatures to achieve a destruction and removal efficiency greater than 99%. Reactivated carbon is produced from the treatment unit such that the reactivated carbon contains less than 10 ppmw benzene.

The facility currently operates as an interim status facility under the Resource Conservation and Recovery Act (RCRA) and is limited to a maximum production capacity of 1200 lb/hr of reactivated carbon. However, the existing reactivation treatment unit has a nominal production capacity of 600 lb/hr of reactivated carbon.

Sources of potential benzene emissions from Subpart FF waste include:

- Carbon adsorbers (WS-1 and WS-2), which control spent carbon storage and furnace feed tank volatile organic compound (VOC) emissions, including benzene.
- Emissions associated with the reactivation treatment unit (RF-1 and AB-1).
- Fugitive emissions from the unloading of spent carbon into hoppers H-1 and H-2.

**5. The Average Weight Per Month of Hazardous Materials Processed [§61.10(a)(5)]:**

The facility commenced operation in August 1992 and processed 90.24 pounds of benzene prior to May 1, 1993. The average weight per month of benzene processed was approximately 10 pounds. This monthly amount of benzene processed has been averaged over the nine month period from August 1992 though April 1993.

**6. Description of Existing Control Equipment [§61.10(a)(6)]:**

<u>WS-1 and WS-2</u>

Carbon adsorbers WS-1 and WS-2 remove VOCs from the spent carbon storage and furnace feed tanks. WS-1 is a carbon canister that contains approximately 1,000 pounds of activated carbon. WS-2 contains 4,500 pounds of activated carbon. These devices are designed to control organic emissions by at least 95%, or benzene by at least 98%.

<u>H-1 and H-2</u>

No specific Subpart FF emissions standards apply to the unloading hoppers (H-1 and H-2). However, in an effort to minimize fugitive dust emissions that potentially contain benzene, WCAI has implemented water spray controls during the unloading operation.

**EXISTING SOURCE NOTIFICATION REQUIRED BY 40 CFR 61.10**
**WESTATES CARBON - ARIZONA, INC.**
**(CONT.)**

7. **Statement of Compliance [§61.10(a)(7)]:**

The emissions from the WCAI Parker, Arizona facility can meet the emission limitations contained in the National Emission Standards as of the date of this notification.

Mr. Monte McCue
Manager

6-6-95

Date

# Appendix C
# Engineering Calculations Supporting Control Device Performance

# Engineering Calculations Supporting Control Device Performance

The Evoqua Water Technologies (EWT) Parker, Arizona facility operates two carbon adsorbers (WS-1 and WS-3), which will treat the vapors from the spent carbon storage tanks, recycle water tank and furnace feed tank. WS-1 treats vapors from spent carbon storage tanks T-1, T-2, T-5, T-6 and T-9.

| **DESIGN PARAMETER** | **WS-1** (T-1,2,5,6,9) | **WS-3** (T-18) |
|---|---|---|
| Maximum Flow Rate (cfm) | 115 | 5.9 |
| Inlet Benzene Concentration (ppmv) | 4,540 | 4,540 |
| Relative Humidity (%) | 50% | 50% |
| Temperature | Ambient | Ambient |
| Type of Carbon | Granulated Activated Carbon | Granulated Activated Carbon |
| Capacity of Carbon Canister (lbs.) | 4000 | 1000 |
| Working Capacity of Activated Carbon | 30% | 30% |
| Source Operating Schedule | Continuous | Continuous |
| Theoretical Design Control Efficiency (%) | 100 | 100 |
| Design Carbon Replacement Period (Days) | 7.88 | 38 |
| Theoretical Outlet Benzene Concentration (ppmv) | 0 | 0 |

Calculations and technical data to support the above design parameters are provided below:

## Flow Rate

The flow rates to WS-1 and WS-3 are based on the actual observed maximum flow rates. The maximum daily flow rates used in the calculations below more accurately reflect maximum conditions anticipated during the life of each carbon bed.

## Inlet Benzene Concentration

The inlet vent stream composition consists of air, water vapor, and entrained hydrocarbon from the spent carbon received at the facility. In preparing this analysis, it is assumed that the total hydrocarbon concentration of the spent carbon can be as high as 30%, and that the maximum benzene concentration can be as high as 15%.

The inlet benzene concentration for WS-1 is calculated assuming that all of the benzene absorbed by the water in contact with spent carbon is liberated in the spent carbon storage tanks. Using the attached isotherm, a 15% benzene concentration in the waste would correspond to a 30 ppmw (mg/l) concentration of benzene in the water. The inlet benzene concentration is determined for WS-1 as follows:

- Determine the amount of benzene being liberated from the water in the spent carbon storage tanks.

$$\mathbf{B_{WS1}} = (FR)(C)(WF)(28.32\ L/ft^3)(2.2 \times 10^{-6}\ lb/mg)\ (60\ min/hr)$$

where:

$\mathbf{B_{WS1}}$ = Amount of Benzene Directed to WS-1 (lb/hr)
**FR** = Amount of Slurry Being Added to the Tanks or Vapor Directed to WS-1 (cfm)
**C** = Concentration of Benzene in the Water (30 mg/L)
**WF** = Fraction of Water by Volume in the Slurry(0.50)

$$\mathbf{B_{WS1}} = (115\ cfm)(30\ mg/L)(0.5)(28.32\ L/ft^3)(2.2 \times 10^{-6}\ lb/mg)(60\ min/hr)$$

$$\mathbf{B_{WS1}} = 6.448\ lb/hr$$

- Determine the concentration of benzene (ppmv) being liberated to WS-1**.**

$$\mathbf{CONC} = \frac{[(B_{WS1}) / (MW_B)](1,000,000)]}{[(FR)(60\ min/hr)] / (MVOL)]}$$

where:

**CONC** = The Inlet Benzene Concentration to WS-1 (ppmv)
$\mathbf{B_{WS1}}$ = Amount of Benzene Directed to WS-1 (lb/hr)
$\mathbf{MW_B}$ = Molecular Weight of Benzene (78.12 lb/lb-mol)
**FR** = Vapor Flow Rate to WS-1 (cfm)

**MVOL** = Molar Volume of Gas (379 $ft^3$/lb-mol)

$$\text{CONC} = \frac{[(6.448 \text{ lb/hr}) / (78.12 \text{ lb/lb-mol})](1{,}000{,}000)]}{[(115 \text{ cfm})(60 \text{ min/hr})] / (379 \text{ ft}^3/\text{lb-mol})]}$$

**CONC** = 4,534 ppmv

For calculation purposes, the concentration of benzene is assumed the same at WS-1 and WS-3.

**Working Capacity of the Activated Carbon**

The working capacity of the carbon is determined using the attached isotherm. This isotherm indicates that the working capacity of WS-1 and WS-3 is approximately 30% for benzene.

**Design Replacement Period**

The design replacement period is calculated using the following equation:

$$Y = \frac{(ACgac / 100)\ (Wgac)}{[(Ci - Co) / 10^6](Qf)(D)(1440 \text{ min/day})]}$$

where:

**Y** = Carbon Bed Life (days)
**ACgac** = Adsorption Capacity of Carbon for Benzene (wt. %)
**Wgac** = Mass of Carbon Bed (lb)
**Ci** = Inlet Concentration Benzene (ppmv)
**Co** = Outlet Concentration Benzene (0 ppmv)
**Qf** = Gas Flow Rate Through Adsorber (cfm)
**D** = Density of Benzene (0.2028 lb/$ft^3$)

- Calculate the design carbon replacement period for **WS-1** using the above equation.

$$Y = \frac{(30 / 100)(4000 \text{ lb})}{((4540 - 0) / 10^6)(115 \text{ cfm})(0.2028 \text{ lb/ft}^3)(1440 \text{ min/day}))}$$

**Y** = **7.88 days**

- Calculate the design carbon replacement period for **WS-3** using the above equation.

$$\mathbf{Y} = \frac{(30 / 100)(1000 \text{ lb})}{((4534 - 0) / 10^6)(5.9 \text{ cfm})(0.2028 \text{ lb/ft}^3)(1440 \text{ min/day}))}$$

$$\mathbf{Y} = \mathbf{38 \text{ days}}$$

# Appendix D
# Description of Process Parameters Monitored

**Description of Process Parameters Monitored**
**Evoqua Water Technologies – Parker, Arizona**

| PROCESS PARAMETER MONITORED | REASON FOR SELECTING PARAMETER |
|---|---|
| Temperature Indicators on Afterburner (AB-2) | Temperature is the best parameter for detecting proper afterburner combustion and performance, and assuring compliance with Subpart FF. |
| Temperature Indicators on hearths 3-5 on Reactivation Furnace (RF-2) | Temperature is the best parameter for detecting proper reactivation furnace combustion and performance, and assuring compliance with Subpart FF. |

**THE TREATMENT UNIT DESIGN SPECIFICATIONS ARE MAINTAINED IN THE ADMINISTRATION OFFICE**

Appendix E
Subpart FF Compliance Records and Other Information
(Representative Documents Only. Current Records Maintained in Facility Files)

- Annual Reports
- Quarterly Visual Inspection Records
- Annual Method 21 Inspection Records
- Debris Bin and Associated Drum Inspection Records
- Carbon Canister Replacement Logs
- Engineering Calculations Supporting Treatment Unit Performance

Parker Facility

January 2018 - December 2018

# Benzene NESHAP Report

| Gen Name: | Profile | Gen EPA ID | FF | Arrival Date | Manifest Do | Qty | Container | PPM | Pounds |
|---|---|---|---|---|---|---|---|---|---|
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 3/13/2018 | 008186994 J | 2 | VSC 1200 | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 6/19/2018 | 017924946 J | 4 | VSC 1200 | 815 | 3.26 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 7/17/2018 | 017924982 J | 2 | VSC 1200 | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 10/2/2018 | 017924980 J | 1 | SC 2000 (Nev | 815 | 1.63 |
| [redacted] | W20362RH-7 | CAD041520644 | ☑ | 12/27/2018 | 017924981 J | 1 | SC 2000 (Nev | 815 | 1.63 |
| | | | | | | **Profile Total Pounds** | | | **9.78** |
| [redacted] | W180072RH | CAD009114919 | ☑ | 10/23/2018 | 013678870 J | 4 | Drum | 1430 | 1.24696 |
| | | | | | | **Profile Total Pounds** | | | **1.24696** |
| [redacted] | W170020RH | LAD000755793 | ☑ | 8/21/2018 | 017289322 J | 2 | PV1000 | 0.897 | 0.003588 |
| | | | | | | **Profile Total Pounds** | | | **0.003588** |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 1/23/2018 | 008186982 J | 8 | Drum | 0.4515 | 0.00078742 |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 5/29/2018 | 018508514 J | 8 | Drum | 0.4515 | 0.00078742 |
| [redacted] | W110148RH-3 | CAD041520644 | ☑ | 12/18/2018 | 018508877 J | 8 | Drum | 0.4515 | 0.00078742 |
| | | | | | | **Profile Total Pounds** | | | **0.00236225** |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 3/9/2018 | 016186328 J | 5 | VSC 1200 | 0.01 | 0.00005 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/1/2018 | 016186329 | 4 | VSC 1200 | 0.01 | 0.00004 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/1/2018 | 016186330 J | 5 | VSC 1200 | 0.01 | 0.00005 |
| [redacted] | W140209RH-1 | TXR000001016 | ☑ | 6/28/2018 | 016186331 J | 3 | VSC 1200 | 0.01 | 0.00003 |
| | | | | | | **Profile Total Pounds** | | | **0.00017** |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/8/2018 | 016186332 J | 5 | VSC 1200 | 731 | 3.655 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/8/2018 | 016186332 J | 4 | Drum | 731 | 0.637432 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/29/2018 | 018026292 J | 2 | VSC 1200 | 731 | 1.462 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 10/29/2018 | 018026292 J | 3 | Drum | 731 | 0.478074 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 12/3/2018 | 018026293 J | 4 | VSC 1200 | 731 | 2.924 |
| [redacted] | W140209RH-3 | TXR000001016 | ☑ | 12/3/2018 | 018026293 J | 1 | Drum | 731 | 0.159358 |
| | | | | | | **Profile Total Pounds** | | | **9.315864** |
| [redacted] | W180094RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 2 | PV1000 | 560 | 2.24 |
| [redacted] | W180094RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 2 | PV2000 | 560 | 4.48 |
| | | | | | | **Profile Total Pounds** | | | **6.72** |

| Gen Name: | Profile | Gen EPA ID | FF | Arrival Date | Manifest Do | Qty | Container | PPM | Pounds |
|---|---|---|---|---|---|---|---|---|---|
| [redacted] | W170002RH | LAD020877361 | ☑ | 3/2/2018 | 007672687 F | 12 | Drum | 3100 | 8.1096 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 6/14/2018 | 007672689 F | 2 | Bag | 3100 | 8.06 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 8/24/2018 | 007672688 F | 1 | Bag | 3100 | 4.03 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 10/26/2018 | 007672691 F | 2 | Bag | 3100 | 8.06 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 11/16/2018 | 007672692 F | 2 | Drum | 3100 | 1.3516 |
| [redacted] | W170002RH | LAD020877361 | ☑ | 11/16/2018 | 007672692 F | 4 | VSC 1200 | 3100 | 12.4 |
| | | | | | | **Profile Total Pounds** | | | **42.0112** |
| [redacted] | W170117RH | CA0001576081 | ☑ | 3/2/2018 | 004491797 J | 4 | Bag | 190 | 0.988 |
| [redacted] | W170117RH | CA0001576081 | ☑ | 3/2/2018 | 004491798 J | 10 | Bag | 190 | 2.47 |
| | | | | | | **Profile Total Pounds** | | | **3.458** |
| [redacted] | W170036RH | LA0000145797 | ☑ | 8/21/2018 | 007581250 J | 4 | Bag | 17.4 | 0.09048 |
| | | | | | | **Profile Total Pounds** | | | **0.09048** |
| | | | | | | **Report Total Pounds** | | | **72.62862425** |

# Debris Bin Testing Summary

| Date Shipped | Manifest Number | Weight | Bin Number | Accumulation Days | First Addition | Background Reading | Highest Reading Around Lid | Last Load Sealed | Background Reading | Highest Reading Around Lid |
|---|---|---|---|---|---|---|---|---|---|---|
| 8/9/2016 | 009918524 FLE | 37,920 | **CHHT 40226** | **88** | **5/13/2016** | **<5** | **<5** | **8/8/2016** | **<5** | **<5** |
| 9/30/2016 | 008812441 FLE | 19,750 | **CHHP20366** | **37** | **8/24/2016** | **<5** | **<5** | **9/12/2016** | **<5** | **<5** |
| 12/5/2016 | 010293492 FLE | 31,540 | **CHHP40217** | **84** | **9/12/2016** | **<5** | **<5** | **12/6/2016** | **<5** | **<5** |
| 3/2/2017 | 010508884 FLE | 23,530 | **CHHP20365** | **82** | **12/10/2016** | **<5** | **<5** | **2/27/2017** | **<5** | **<5** |
| 5/3/2017 | 010559476 FLE | 15,650 | **CHHP21061** | **58** | **3/6/2017** | **<5** | **<5** | **4/28/2017** | **<5** | **<5** |
| 8/17/2017 | 011013823 FLE | 15,250 | **251328** | **89** | **5/20/2017** | **<5** | **<5** | **8/16/2017** | **<5** | **<5** |
| 10/11/2017 | 011012274 FLE | 21,300 | **251351** | **51** | **8/21/2017** | **<5** | **<5** | **10/10/2017** | **<5** | **<5** |
| 1/10/2018 | 011248349 FLE | 11,310 | **CHHP20905** | **86** | **10/16/2017** | **<5** | **<5** | **1/10/2018** | **<5** | **<5** |
| 4/4/2018 | 011704651 FLE | 22,870 | **251027** | **80** | **1/14/2018** | **<5** | **<5** | **4/10/2018** | **<5** | **<5** |
| 6/27/2018 | 011211176 FLE | 16,130 | **CHHP20417** | **78** | **4/10/2018** | **<5** | **<5** | **6/27/2018** | **<5** | **<5** |
| 9/25/2018 | 012325495 FLE | 19,110 | **CHHP20985** | **85** | **7/2/2018** | **<5** | **<5** | **9/24/2018** | **<5** | **<5** |
| 12/27/2018 | 012324667 FLE | 22,520 | **251488** | **83** | **10/5/2018** | **<5** | **<5** | **12/27/2018** | **<5** | **<5** |
| 3/26/2019 | 012831360 FLE | 23,170 | **CHHP21119** | **81** | **1/4/2019** | **<5** | **<5** | **3/26/2019** | **<5** | **<5** |
| 5/13/2019 | 013487828 FLE | 12,730 | **CHHP21069** | **67** | **3/7/2019** | **<5** | **<5** | **5/13/2019** | **<5** | **<5** |
| 7/17/2019 | 013587416 FLE | | | **58** | **5/20/2019** | **<5** | **<5** | **7/16/2019** | **<5** | **<5** |
| | | | | | | | | | | |
| | | | | | | | | | | |

CALCULATION OF BENZENE REMOVAL
IN THE
12'-10" OD X 5 HEARTH CARBON REACTIVATION FURNACE (RF-2)
FOR
EVOQUA WATER TECHNOLOGIES
PARKER, AZ FACILITY

Assumptions:

1) Inlet benzene concentration = 150,000 ppmwd.
2) Outlet benzene concentration <_ 10 ppmwd.

Given:

1) RF-2 capacity = 1200 lbs/hr dry regenerated carbon.

2) RF-2 carbon residence time = 37.8 minutes total at centershaft speed of one revolution per 54 seconds (50% on VFD).

3) Only vapor-phase carbon can contain 15% by weight benzene and is subject to 40CFR61, Subpart FF. Maximum adsorbate loading on vapor-phase carbon is thirty percent by weight (on-half of loading is benzene). Maximum adsorbate loading on liquid-phase carbon is only five percent by weight.

4) RF-2 furnace typical temperature profile during regeneration of vapor-phase carbon:

| | Gas Temperatures, °F |
|---|---|
| Hearth 1 | 500 |
| Hearth 2 | 700 |
| Hearth 3 | 1000 |
| Hearth 4 | 1400 |
| Hearth 5 | 1400 |

All temperatures shown are minimum values, actual gas phase temperatures during reactivation of vapor-phase carbons with 30 wt.% adsorbate loading will typically be 100°F to 500°F higher.

5) RF-2 is a 12'10" OD X 5 hearth furnace with a total of 356 $ft^2$ hearth area:

Hearth 1 = 60.0 $ft^2$
Hearth 2 = 77.0 $ft^2$
Hearth 3 = 60.0 $ft^2$
Hearth 4 = 77.0 $ft^2$
Hearth 5 = 81.5 $ft^2$

Total = 355.5 $ft^2$

6) The overall heat transfer coefficient, U, with the units of BTU/hr-$ft^2$-°F can be approximated by Tgas/100 in a multiple hearth furnace.

Calculate the location in RF-2 when carbon reaches the critical temperature for benzene (553°F):

Inlet benzene mass rate = 1200 lbs/hr X 150,000 ppmwd / 1,000,000
= 180 lbs/hr benzene

Outlet benzene mass rate <_ 1200 lbs/hr X 10 ppmwd / 1,000,000
<_ 0.012 lbs/hr benzene

Minimum benzene removal = 180 - 0.012 = 179.988 lbs/hr benzene
= (180 - 0.012)/180 X 100 = 99.993%

Calculate feed carbon composition:

Feed is 40% by weight water
Dry feed = 1,200 lbs/hr carbon + 180 lbs/hr benzene + 180 lbs/hr "other" adsorbate"
= 1,560 lbs/hr
Wet feed = 1,560/.60 = 2,600 lbs/hr
Water in feed = 2,600 - 1,560 = 1,040 lbs/hr

Hearth 1: hearth area = 60 $ft^2$, gas temp. = 500°F

Heat transfer to bed required to heat carbon, benzene and water to 134°F

$$Qbed = U \cdot A \cdot \Delta T$$

$$= 500/100 \cdot 60 \cdot \frac{[(500-60) - (500-134)]}{\ln [(500-60)/(500-134)]}$$

$= 5 \cdot 60 \cdot [(440 - 366) / \ln (440/366)]$

$= 5$ BTU/hr-ft²-°F $\cdot$ 60 ft² $\cdot$ 401.9°F

= 120,560 BTU/hr

Heat carbon, benzene, "other" adsorbate and water to 134°F:

$Qc = W \cdot Cp \cdot \Delta T$
= 1200 lbs/hr · 0.33 BTU/lb-°F · (134-60)°F
= 29,304 BTU/hr for carbon

$Qb = W \cdot Cp \cdot \Delta T$
= 180 lbs/hr · 0.50 BTU/lb-°F · (134-60)°F
= 6,660 BTU/hr for benzene

$Qo = W \cdot Cp \cdot \Delta T$
= 180 lbs/hr · 0.50 BTU/lb-°F · (134-60)°F
= 6,660 BTU/hr for "other" adsorbate

$Qw = W \cdot Cp \cdot \Delta T$
= 1,040 lbs/hr · 1 BTU/lb-°F · (134-60)°F
= 76,960 BTU/hr for water

$Qt = Qc + Qb + Qo + Qw = 29{,}304 + 6{,}660 + 6{,}660 + 76{,}960 = 119{,}584$ BTU/hr

Hearth 2: hearth area = 77 ft², gas temp. = 700°F

---

Heat transfer to bed:

$Qbed = U \cdot A \cdot \Delta T$

$$= 700/100 \cdot 77 \cdot \frac{[(800-134) - (800-212)]}{\ln [(800-134)/(800-212)]}$$

$= 7 \cdot 77 \cdot [(566 - 488) / \ln (566/488)]$

$= 7$ BTU/hr-ft²-°F $\cdot$ 77 ft² $\cdot$ 526.0°F

= 283,534 BTU/hr

Heat carbon, benzene, "other" adsorbate and water from 134°F to 212°F:

$Qc = W \cdot Cp \cdot \Delta T$
$= 1200 \text{ lbs/hr} \cdot 0.33 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 30{,}888$ BTU/hr for carbon

$Qb = W \cdot Cp \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.50 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 7{,}020$ BTU/hr for benzene

$Qo = W \cdot Cp \cdot \Delta T$
$= 180 \text{ lbs/hr} \cdot 0.50 \text{ BTU/lb-°F} \cdot (212-134)\text{°F}$
$= 7{,}020$ BTU/hr for "other" adsorbate

$Qw = W \cdot Cp \cdot \Delta T$
$= 1{,}040 \text{ lbs/hr} \cdot 1 \text{ BTU/lb-°F} \cdot (212 - 134)\text{°F}$
$= 81{,}120$ BTU/hr for water

$Qt = Qc + Qb + Qo + Qw = 30{,}888 + 7{,}020 + 7{,}020 + 81{,}120 = 126{,}048$ BTU/hr

Remaining energy to evaporate water:

$Qe = Qbed - Qt = 283{,}534 - 126{,}048 = 157{,}486$ BTU/hr

@ 212°F one pound of water requires 970 BTU/lb for evaporation

157,486 BTU/hr / 970 BTU/lb = 162.4 lbs/hr water evaporated from hearth 2

water remaining = 920 - 162.4 = 877.6 lbs/hr water

Hearth 3: hearth area = 60 ft$^2$, gas temp. = 1000°F

---

Heat transfer to bed:

$Qbed = U \cdot A \cdot \Delta T$

$= 1000/100 \cdot 60 \cdot (1000 - 212)$

$= 10 \text{ BTU/hr-ft}^2\text{-°F} \cdot 60 \text{ ft}^2 \cdot 788\text{°F}$

$= 472{,}800$ BTU/hr

Evaporate water:

472,800 BTU/hr / 970 BTU/lb = 487.4 lbs/hr water evaporated from hearth 3

water remaining = 877.6 - 487.4 = 390.2 lbs/hr water

Hearth 4: hearth area = 77 ft$^2$, gas temp. = 1400°F

---

Evaporate remaining water:

390.2 lbs/hr water · 970 BTU/lb = 378,514 BTU/hr

Hearth area required to evaporate remaining water:

$A = Q / (U \cdot \Delta T)$

$= 378{,}514$ BTU/hr / [14 BTU/hr-ft$^2$-°F · (1400 - 212)°F

$= 22.8$ ft$^2$

Hearth area remaining = 77 - 22.8 = 54.2 ft$^2$

Heat required to raise temperature of carbon, benzene, and "other" adsorbate from 212°F to 553°F:

$Q_c = W \cdot C_p \cdot \Delta T$
= 1200 lbs/hr · 0.33 BTU/lb-°F · (553 - 212)°F
= 135,036 BTU/hr for carbon

$Q_b = W \cdot C_p \cdot \Delta T$
= 180 lbs/hr · 0.33 BTU/lb-°F · (553 - 212)°F
= 30,060 BTU/hr for benzene

$Q_b = W \cdot C_p \cdot \Delta T$
= 180 lbs/hr · 0.33 BTU/lb-°F · (553 - 212)°F
= 30,060 BTU/hr for "other" adsorbate

$Q_t = Q_c + Q_b = 135{,}036 + 30{,}060 + 30{,}060 = 196{,}416$ BTU/hr

Hearth area required to temperature of carbon and benzene to 553°F:

$A = Q / (U \cdot \Delta T)$

$$= 196{,}416 \;/\; \left(14 \cdot \frac{[(1400-212) - (1400-553)]}{\ln\,[(1400-212)/(1400-553)]}\right)$$

$$= 196{,}416 \;/\; (14 \cdot [(118 - 847) \;/\; \ln\,(1108/847)])$$

$$= 196{,}416 \text{ BTU/hr} \;/\; (14 \text{ BTU/hr-ft}^2\text{-}^\circ\text{F} \cdot 1007.9^\circ\text{F})$$

$$= 13.9 \text{ ft}^2$$

Hearth area remaining = 54.2 - 13.9 $ft^2$ = 40.3 $ft^2$

Percentage of hearth 4 area remaining = 40.3 / 77 · 100 = 52 %

After 4½ minutes on hearth 4 of RF-2, temperature of the carbon, benzene and "other" adsorbate is above 553°F (the critical temperature for benzene). By definition, benzene cannot be liquefied (adsorbed) by pressure alone above this temperature and exerts a vapor pressure in excess of 60 atmospheres. The carbon remains above the critical temperature for an additional 12½ minutes until discharged from the furnace.

Due to the extreme volatility of benzene at elevated temperatures and the length of time at which the carbon is subjected to temperatures above the critical temperature for benzene, all benzene is removed (vaporized) from the carbon prior to discharge from RF-2. Since gas flow is counter-current to solids flow in a multiple hearth furnace and the lower half of the furnace is maintained above the critical temperature of benzene, there is no possibility of desorbed benzene being re-adsorbed onto the reactivated product.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 1 | H-1 Hopper Waste Feed Closed | | | | | | | |
| 2 | H-1 Hopper Eductor, Piping and Victaulics | | | | | | | |
| 3 | H-1 Hopper Flanges, Piping and Victaulics | | | | | | | |
| 4 | H-1 Hopper Vault Door | | | | | | | |
| 5 | H-2 Hopper Waste Feed Closed | | | | | | | |
| 6 | H-2 Hopper Eductor Flanges and Victaulics | | | | | | | |
| 7 | H-2 Hopper Piping and Victaulics | | | | | | | |
| 8 | RF-2 Hearth 1 Door West | | | | | | | |
| 9 | RF-2 Seal Welded Flat - between 1 and 2 | | | | | | | |
| 10 | RF-2 Hearth 2 Door East | | | | | | | |
| 11 | RF-2 Seal Welded Flat - between 2 and 3 | | | | | | | |
| 12 | RF-2 Hearth 3 Door East | | | | | | | |
| 13 | RF-2 Seal Welded Flat - between 3 and 4 | | | | | | | |
| 14 | RF-2 Hearth 4 Door East | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 15 | RF-2 Seal Welded Flat - between 4 and 5 | | | | | | | |
| 16 | RF-2 Hearth 5 Door East | | | | | | | |
| 17 | RF-2 Welded Seam on Furnace Bottom | | | | | | | |
| 18 | RF-2 Top Sand Seal | | | | | | | |
| 19 | RF-2 Bottom Sand Seal | | | | | | | |
| 20 | RF-2 Carbon Outlet Piping and Flanges | | | | | | | |
| 21 | T-1 Ball Valves | | | | | | | |
| 22 | T-1 Couplings | | | | | | | |
| 23 | T-1 Eductor & Fittings | | | | | | | |
| 24 | T-1 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 25 | T-1 Fittings & Valves | | | | | | | |
| 26 | T-1 (SEE ATTACHMENT No. 1) | | | | | | | |
| 27 | T-1 Pressure Relief Valve | | | | | | | |
| 28 | T-1 Slurry Line | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

# Annual Method 21 Testing

**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID**

**Tested By:**

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 29 | T-1 Tank Flanges | | | | | | | |
| 30 | T-1 Vent Pipe To WS-1 | | | | | | | |
| 31 | T-2 Ball Valves | | | | | | | |
| 32 | T-2 Couplings | | | | | | | |
| 33 | T-2 Eductor & Fittings | | | | | | | |
| 34 | T-2 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 35 | T-2 Fittings & Valves | | | | | | | |
| 36 | T-2 Tank (SEE ATTACHMENT No. 1) | | | | | | | |
| 37 | T-2 Pressure Relief Valve | | | | | | | |
| 38 | T-2 Slurry Line | | | | | | | |
| 39 | T-2 Tank Flanges | | | | | | | |
| 40 | T-2 Vent Pipe To WS-1 | | | | | | | |
| 41 | T-5 Ball Valves | | | | | | | |
| 42 | T-5 Couplings | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 43 | T-5 Eductor & Fittings | | | | | | | |
| 44 | T-5 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 45 | T-5 Fittings & Valves | | | | | | | |
| 46 | T-5 (SEE ATTACHMENT No. 2) | | | | | | | |
| 47 | T-5 Pressure Relief Valve | | | | | | | |
| 48 | T-5 Slurry Line | | | | | | | |
| 49 | T-5 Tank Flanges | | | | | | | |
| 50 | T-5 Vent Pipe To WS-1 | | | | | | | |
| 51 | T-6 Ball Valves | | | | | | | |
| 52 | T-6 Couplings | | | | | | | |
| 53 | T-6 Eductor & Fittings | | | | | | | |
| 54 | T-6 Fill Slurry Lines & Vics From H-1, H-2 | | | | | | | |
| 55 | T-6 Fittings & Valves | | | | | | | |
| 56 | T-6 (SEE ATTACHMENT No. 2) | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 57 | T-6 Pressure Relief Valve | | | | | | | |
| 58 | T-6 Slurry Line | | | | | | | |
| 59 | T-6 Tank Flanges | | | | | | | |
| 60 | T-6 Vent Pipe To WS-1 | | | | | | | |
| 61 | T-9 (SEE ATTACHMENT No. 3) | | | | | | | |
| 62 | T-9 Level Transmitter | | | | | | | |
| 63 | T-9 Main Bottom Manway Door | | | | | | | |
| 64 | T-9 Return Line and Fittings From T Tanks | | | | | | | |
| 65 | T-9 Return Line and Fittings From T-18 | | | | | | | |
| 66 | T-9 Sump Pump Fittings | | | | | | | |
| 67 | T-9 Vent Line and Fittings To WS-1 | | | | | | | |
| 68 | T-9/P-4 Pump - Inlet Pipe and Fittings | | | | | | | |
| 69 | T-9/P-5 Pump - Inlet Pipe and Fittings | | | | | | | |
| 70 | T-9/P-4 Pump - Outlet Pipe and Fittings | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

Evoqua Water Technologies - Parker, AZ Facility

# Annual Method 21 Testing

40 CFR 61.343, 345, 349

Instrument Used: Foxboro TVA 1000 FID

Tested By:

| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 71 | T-9/P-5 Pump - Outlet Pipe and Fittings | | | | | | | |
| 72 | T-18 Feed Hose & Couplings | | | | | | | |
| 73 | T-18 Feed Valve & Piping | | | | | | | |
| 74 | T-18 Level Indicators | | | | | | | |
| 75 | T-18 Lids (SEE ATTACHMENT No. 4) | | | | | | | |
| 76 | T-18 Return Line, Couplings and Vics | | | | | | | |
| 77 | T-18 Piping and Couplings From T-Tanks | | | | | | | |
| 78 | WS-1 Hatches & Sample Port | | | | | | | |
| 79 | WS-1 Inlet | | | | | | | |
| 80 | WS-1 Outlet | | | | | | | |
| 81 | WS-3 Hatches & Sample Port | | | | | | | |
| 82 | WS-3 Inlet | | | | | | | |
| 83 | WS-3 Outlet | | | | | | | |
| 84 | Dewater Screw (SEE ATTACHMENT No. 4) | | | | | | | |

*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.

**Evoqua Water Technologies - Parker, AZ Facility**

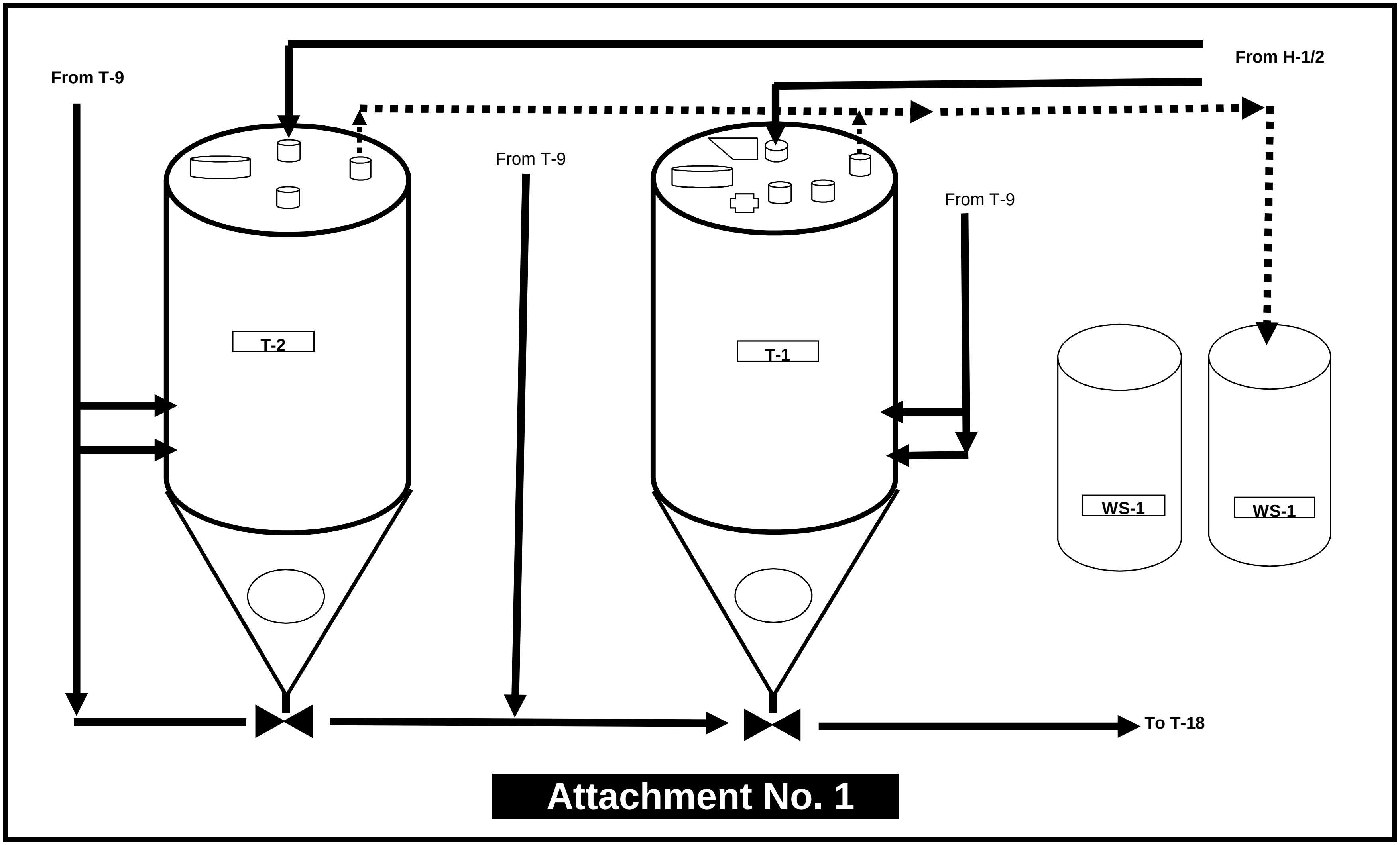
## Annual Method 21 Testing

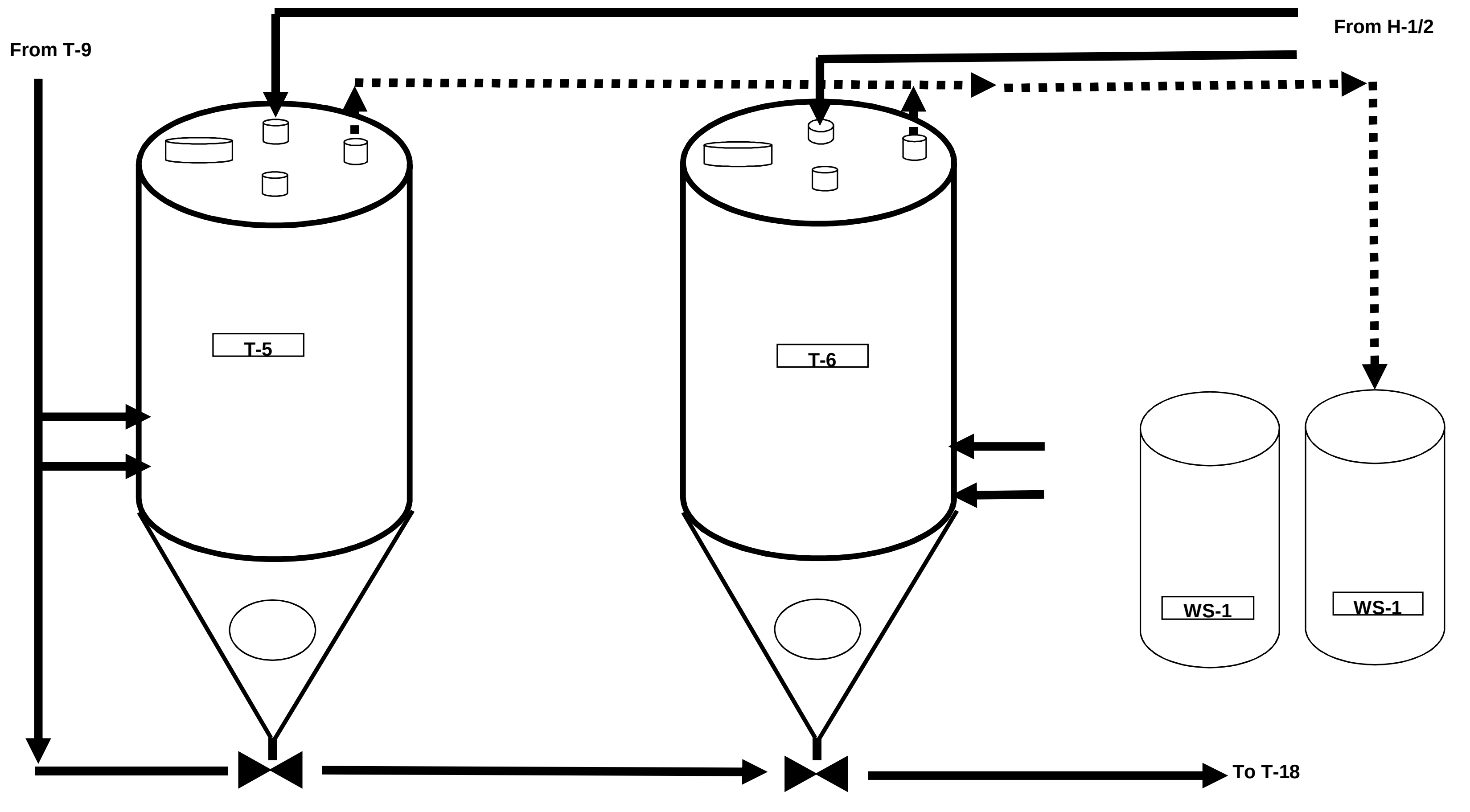
**40 CFR 61.343, 345, 349**

**Instrument Used: Foxboro TVA 1000 FID** **Tested By:**

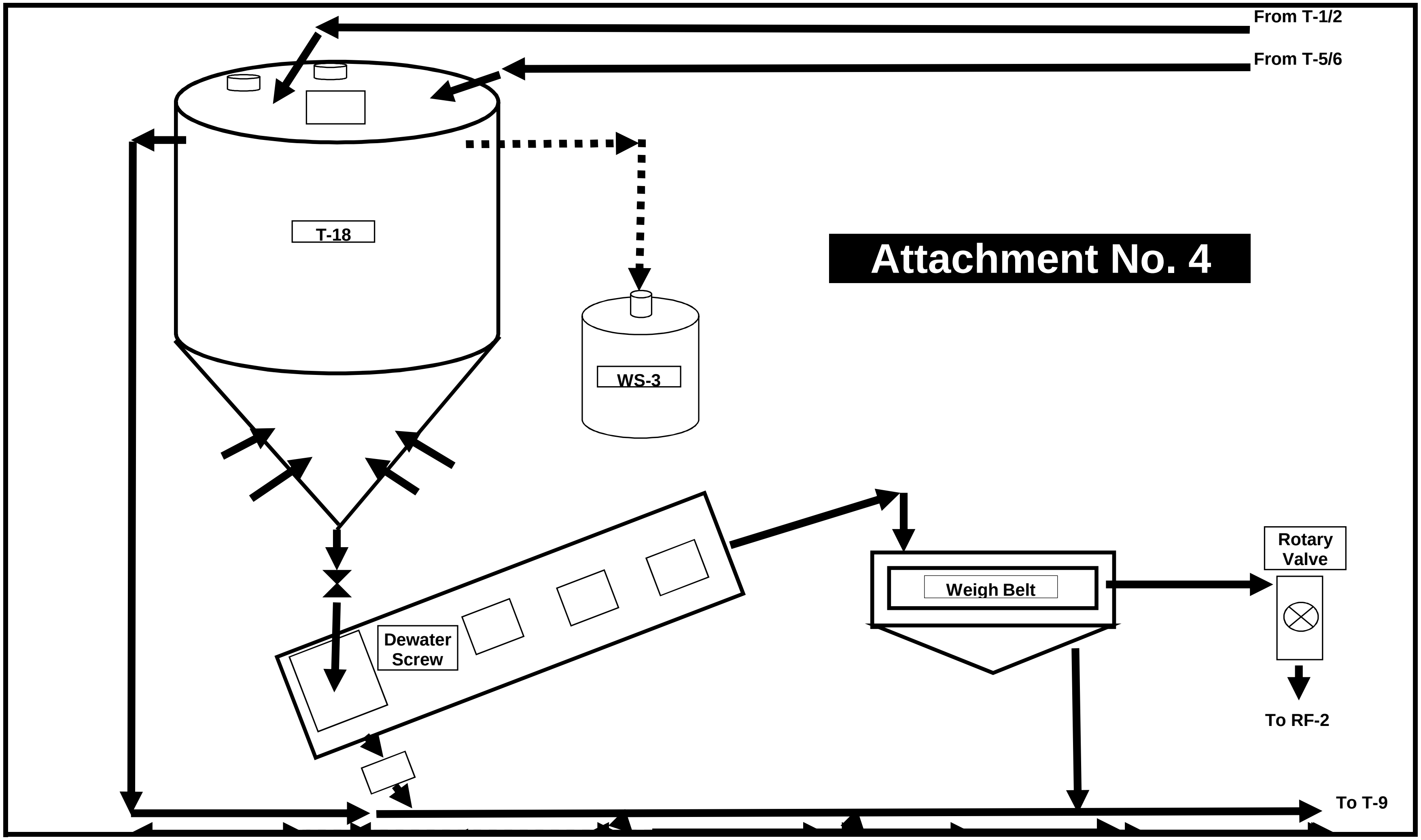
| No. | Location ID | Date Inspected | Measured Concentration (PPMV) | Background Concentration (PPMV) | Leak Detected? (Y/N) * | Description Of Problem | Corrective Action Taken | Date Of Successful Repair ** |
|---|---|---|---|---|---|---|---|---|
| 85 | Weigh Belt Feeder (SEE ATTACHMENT No. 4) | | | | | | | |
| 86 | Rotary Valve (SEE ATTACHMENT No. 4) | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | | | | |
| 89 | | | | | | | | |
| 90 | | | | | | | | |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | | | | |
| 94 | | | | | | | | |

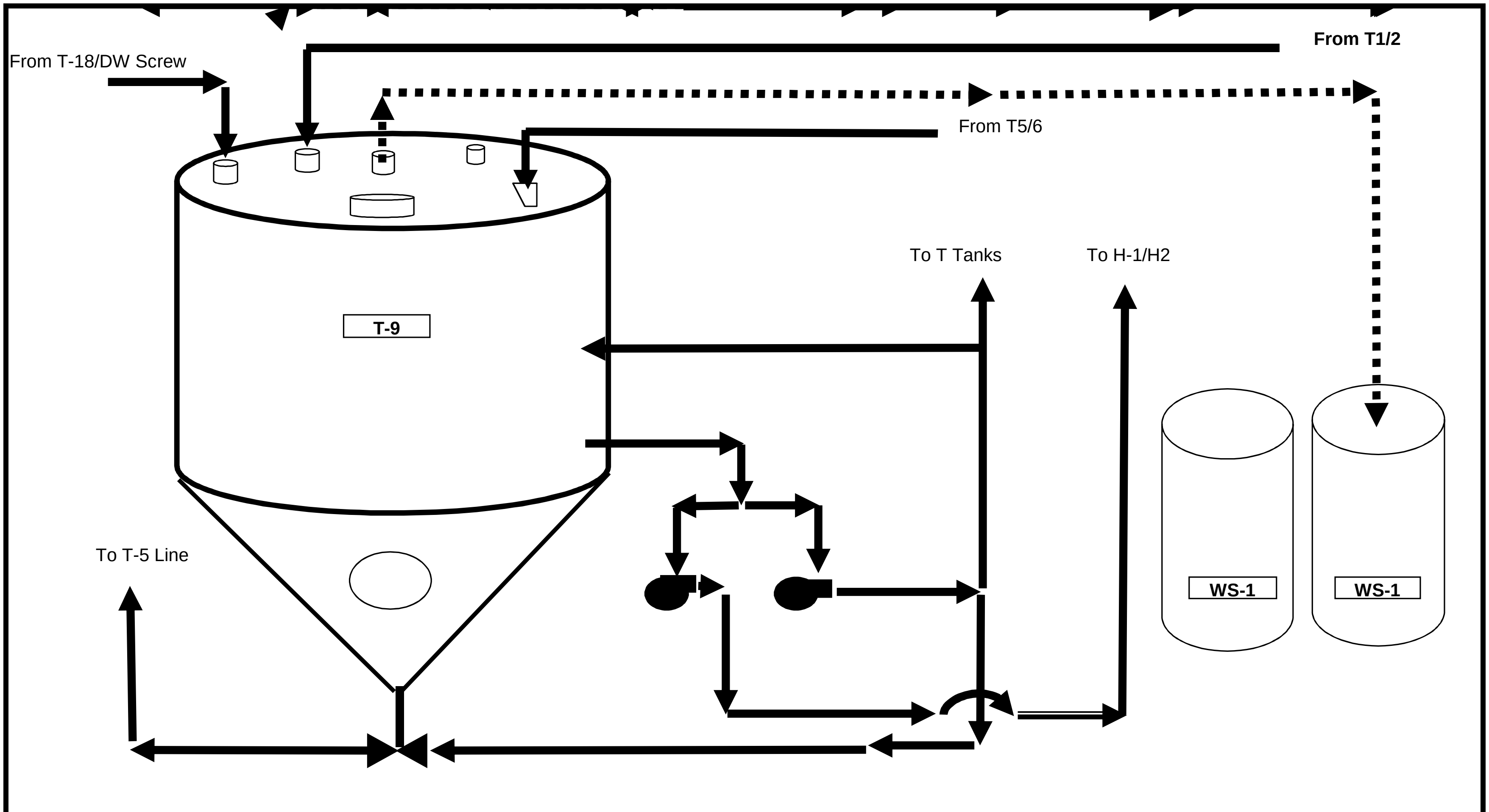
*A leak is detected if the container is not sealed closed, or if the instrument reading exceeds 500 ppmv over the background concentration. **Repair must be completed within 15 days.


From T-9
From H-1/2
From T-9
From T-9
T-2
T-1
WS-1
WS-1
To T-18
Attachment No. 1




Attachment No. 2


From T-1/2
From T-5/6
T-18
WS-3
Attachment No. 4
Dewater Screw
Weigh Belt
Rotary Valve
To RF-2
To T-9




# Attachment No. 3

## Evoqua Water Technologies

# Benzene Neshap Quarterly Inspection

**Process Equipment Assessment For Potential Air Emissions -- 40 CFR 61.343, 345, 348**

**Quarter:__________________ Year:__________________**

| Equipment Description | Mechanical Integrity | Corrective Action Or Maintenance | Reviewed By | Review Date |
|---|---|---|---|---|
| **Carbon Adsorber WS-1** | Breach in container, visible leakage, or corrosion? Yes ☐ No ☐<br>Carbon replacement within specified time period? Yes ☐ No ☐<br>Carbon replacement dates recorded? Yes ☐ No ☐<br>(As verified against " Carbon Canister Replacement Log") | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Carbon Adsorber WS-3** | Breach in container, visible leakage, or corrosion? Yes ☐ No ☐<br>Carbon replacement within specified time period? Yes ☐ No ☐<br>Carbon replacement dates recorded? Yes ☐ No ☐<br>(As verified against " Carbon Canister Replacement Log") | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Drums, Vessels or Bags In Storage** | All drums/vessels sealed? Yes ☐ No ☐<br>Breach in drums/vessels, visible leakage or corrosion? Yes ☐ No ☐<br>Any bags torn or leaking? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Recycle and Spent Carbon Tanks** | T-1 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-2 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-5 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-6 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-9 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐<br>T-18 Manways sealed, flanges blinded, no leakage? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Dewater Screw** | Any visible fugitive emissions or leakage? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Afterburner** | Temperature at or above 1800 F at all times? Yes ☐ No ☐<br>(As verified against the afterburner temperature on the process monitoring logs) | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **Slurry Piping** | Any corrosion? Yes ☐ No ☐<br>Any leakage? Yes ☐ No ☐<br>Any cracking or metal fatigue? Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |
| **H-1 and H-2 Waste Feed Cutoff Seal (Cover)** | H-1 WFCO Valve Seal? Yes ☐ No ☐<br>H-2 WFCO Valve Seal Yes ☐ No ☐ | ☐ No corrective action/maintenance required at present.<br>☐ Corrective action or maintenance is required; describe : | | |

| 4000 lbs | WS-1 (7.8 Days) | | | | |
|---|---|---|---|---|---|
| Periodic Test Before Changeout | Change Out | Last Change | Days | Day | Carbon Used for Change Out |
| | 3/4/2019 | 2/25/2019 | 7 | Mon | VCRS |
| | 3/11/2019 | 3/4/2019 | 7 | Mon | VCRS |
| | 3/18/2019 | 3/11/2019 | 7 | Mon | VCRS |
| | 3/25/2019 | 3/18/2019 | 7 | Mon | VCRS |
| | 4/1/2019 | 3/25/2019 | 7 | Mon | VCRS |
| | 4/8/2019 | 4/1/2019 | 7 | Mon | VCRS |
| | 4/15/2019 | 4/8/2019 | 7 | Mon | VCRS |
| | 4/22/2019 | 4/15/2019 | 7 | Mon | VCRS |
| | 4/29/2019 | 4/22/2019 | 7 | Mon | VCRS |
| | 5/6/2019 | 4/29/2019 | 7 | Mon | VCRS |
| | 5/13/2019 | 5/6/2019 | 7 | Mon | VCRS |
| | 5/20/2019 | 5/13/2019 | 7 | Mon | VCRS |
| | 5/27/2019 | 5/20/2019 | 7 | Mon | VCRS |
| | 6/3/2019 | 5/27/2019 | 7 | Mon | VCRS |
| | 6/10/2019 | 6/3/2019 | 7 | Mon | VCRS |
| | 6/17/2019 | 6/10/2019 | 7 | Mon | VCRS |
| | 6/24/2019 | 6/17/2019 | 7 | Mon | VCRS |
| | 7/1/2019 | 6/24/2019 | 7 | Mon | VCRS |
| | 7/8/2019 | 7/1/2019 | 7 | Mon | VCRS |
| | 7/15/2019 | 7/8/2019 | 7 | Mon | VCRS |

| 1000 lbs | WS-3 (38 days) | | | |
|---|---|---|---|---|
| Periodic Test Before Changeout | Change Out | Last Change | Days | Carbon Used for Change Out |
| | 8/1/18 | 7/2/2018 | 30 | VCRS |
| | 8/31/18 | 8/1/2018 | 30 | VCRS |
| | 10/1/18 | 8/31/2018 | 31 | VCRS |
| | 11/1/18 | 10/1/2018 | 31 | VCRS |
| | 11/30/18 | 11/1/2018 | 29 | VCRS |
| | 12/26/18 | 11/30/2018 | 26 | VCRS |
| | 2/1/19 | 12/26/2018 | 37 | VCRS |
| | 3/1/19 | 2/1/2019 | 28 | VCRS |
| | 4/1/19 | 3/1/2019 | 31 | VCRS |
| | 4/30/19 | 4/1/2019 | 29 | VCRS |
| | 5/30/19 | 4/30/2019 | 30 | VCRS |
| | 7/1/19 | 5/30/2019 | 32 | VCRS |